KPMG Peat Marwick

NOVA SCOTIA
DEPARTMENT OF TRANSPORTATION
AND COMMUNICATIONS

SURFACE FREIGHT TRANSPORTATION: ALTERNATIVES INTO THE 21ST CENTURY

FINAL REPORT

PEAT MARWICK STEVENSON & KELLOGG

NOVEMBER 1989

90-01894/

KPMG Peat Marwick Stevenson & Kellogg

Management Consultants

Suite 1507, Purdy's Wharf Tower
1959 Upper Water Street
Halifax, Nova Scotia B3J 3N2
Canada

Telephone (902) 420 1466
Telefax (902) 422 3556

The Honourable George C. Moody
Minister
Nova Scotia Department of Transportation
and Communications
Halifax, Nova Scotia

November 30, 1989

Dear Mr. Minister:

Surface Freight Transportation: Alternatives into the 21st Century
Executive Summary

The accompanying report records the results of our study on the above subject. This introductory letter provides an executive summary of our findings.

The purpose of the study was to assess and analyze surface freight alternatives in order to assist the Province of Nova Scotia in formulating policies which will ensure that the needs of Nova Scotia shippers, receivers and motorists are provided for into the 21st century.

RAIL VS. ROAD TRENDS

Trucking has emerged as the dominant means of transporting freight in North America. Its growth has been largely at the expense of the rail mode for a number of reasons, including its ability to provide the high service levels required by shippers in today's competitive environment. The trucking industry also enjoys a competitive advantage due to the fact that road infrastructure is provided by the public sector with comparatively low cost recovery in terms of motor carrier user charges. As a result, railways have been actively pursuing rationalization of their systems through abandonment of uneconomic rail lines.

Rail rationalization has been even more acute in Atlantic Canada which has experienced several major abandonments in recent years (e.g., Newfoundland railway). Recent decisions by the National Transportation Agency (e.g., Prince Edward Island, Dominion Atlantic Railway in Nova Scotia) indicate that this trend will continue.

Today, all of the rail lines in Nova Scotia are underutilized to varying degrees. At the same time, increased highway traffic creates a growing requirement to upgrade the highway system. Unfortunately, budgetary constraints limit the available funding, with the end result that the highway system is being compromised.

ROAD TRANSPORT

As stated above, motor carriers have achieved a dominant position in the Nova Scotia freight market. In general, trucking companies serving Nova Scotia have been satisfactorily profitable, although increased competition arising from regulatory reform is now putting some pressure on carrier profits. Average rates have decreased in recent years.

Trucking companies pay user charges in the form of provincial fuel taxes and vehicle licence/registration charges. User charges paid by Nova Scotia based common carriers, expressed as a percentage of total operating costs, have actually decreased from 6% in 1975 to 4% in 1986.

In February 1988 the provinces agreed upon a new schedule of vehicle weights and dimensions. In general these new arrangements permit larger vehicle weights and dimensions, which in turn make some trucking operations more economic in Nova Scotia and elsewhere in Canada. Truck user charges as a percentage of total operating costs are likely to decrease even further as more and more motor carriers take advantage of this development which creates the opportunity to reduce costs.

Road user charges in Nova Scotia, in aggregate, cover approximately two-thirds of the total capital and operating costs of the provincial road network. This cost recovery ratio is slightly higher than New Brunswick's, but is much lower than that achieved in other provinces such as Québec, Ontario and Manitoba. In addition, research indicates that automobiles and lighter vehicles are subsidizing heavier vehicles under the current structure of road user charges.

RAIL TRANSPORT

In response to the gradual diversion of rail traffic to the truck mode (and to the marine mode in some instances), the Nova Scotia rail network has shrunk over the years. The Nova Scotia transportation marketplace has now reached a state of maturity where little freight traffic remains with the potential to shift from rail to truck. The remaining carload rail traffic in Nova Scotia is essentially not truck competitive. For the majority of remaining rail carload shippers, the rail mode is very important or indispensable to their operations.

There is active competition between motor carriers and rail intermodal service. However, rail piggyback traffic is in effect truck traffic as far as Nova Scotia's road system is concerned because the CN intermodal terminal which handles Nova Scotia traffic is located at Moncton, New Brunswick.

The Nova Scotia rail network has been effectively reduced to two rail lines operated by CN Rail: the Halifax-Moncton line and the Truro-Sydney line. The other remaining rail lines — CN's Chester Subdivision and CP's Dominion Atlantic Railway (DAR) — face probable abandonment, although a sixteen km section of the DAR carrying gypsum between Mantua and Hantsport may be preserved. In fact, the National Transportation Agency (NTA) has approved abandonment of the DAR from Kentville to Yarmouth and a NTA decision is pending in regard to the abandonment of a portion of the Chester Subdivision from Barry's Stillwater Marsh to Liverpool.

At present, the Truro-Sydney line is in a break-even condition. However, a number of recent and probable future events lead to the conclusion that the line will be abandoned well before the 21st century in spite of the fact that certain shippers (e.g., Sydney Steel, Stora Forest Industries, Devco, Trenton Works Lavalin) depend on the line to ship and receive freight. These events include: the shift in Newfoundland traffic from Sydney to Halifax, the loss of the VIA Rail passenger service, and predicted losses in coal and gypsum traffic.

The Halifax-Moncton line has recently experienced increases in traffic volumes due principally to increased import/export container traffic through the Port of Halifax and the additional Newfoundland traffic mentioned above. Our analysis shows this line to be reasonably profitable and it should remain so into the 21st century. However, the future of the line does face a degree of uncertainty since it is highly dependent on the import/export container traffic. The volume of container traffic depends on a number of global factors which are beyond the control of the Port of Halifax. While the port has benefitted from these factors in the past (e.g., larger vessels and load centers), it could possibly be a victim of them in the future (e.g., shipping line rationalization and world services).

CONSEQUENCES OF EXISTING GOVERNMENT POLICIES

Present federal and provincial transportation policy tends to encourage the trend from rail to road transport by improving trucking competitiveness (e.g., increases in truck weights and dimensions) in relation to rail, and facilitating the abandonment of rail lines by the railways.

Some provinces might consider that the railways are secure and unlikely to disappear. This view is supported by the belief that because the railways are under federal jurisdiction, the solution to rail problems should and will come from the Government of Canada. The Federal Government, however, is reducing its financial commitment to the rail mode. This, in turn, places added pressure on the surface transportation system. However, if a province cannot find, or fails to allocate the required increased financial resources, the transportation system will continue to deteriorate. This result will be detrimental to both the provincial and Canadian economy.

Nova Scotia's rail network will be reduced to the one main rail line from Halifax to Moncton by the 21st century under current government policies. Its road network will also face some deterioration unless additional revenue is forthcoming to bring roads up to desired standards and correct current and expected capacity deficiencies.

CONCLUSIONS

The continuing decline of the rail mode is not in the best interests of Nova Scotia, even though the truck mode continues to expand and provide good service. While it is unrealistic to seek to reinstate rail branch lines which have been lost, or are likely to be abandoned in the near future, Nova Scotia's essential rail network should be preserved. We conclude that appropriate roles for the rail and road modes can be achieved by maintaining the Halifax-Moncton line (together with essential feeder spurs), the Truro-Sydney line, and any local line serving substantial traffic (e.g., Mantua-Hantsport segment of DAR).

To achieve the desired modal roles outlined above, Nova Scotia must take action to:

- preserve the Truro-Sydney rail line;
- enhance the viability of rail operations;
- support the expansion of domestic intermodal service (e.g., piggyback);
- provide highway funding sufficient to meet the Province's needs.

It is recognized that the Province of Nova Scotia can only achieve the appropriate roles for the freight modes with the collaboration of the Federal Government, the other Canadian provinces and the surface carriers themselves. The surface transportation policies of other Canadian provinces, and particularly those of Atlantic Canada must be reasonably uniform (e.g., vehicle weights and dimensions) if the desired results are to be achieved.

RECOMMENDATIONS

In order for the Province of Nova Scotia to achieve the appropriate roles for the surface freight modes into the 21st century, a number of actions and policy changes should be initiated. These are:

- **Preservation of Truro-Sydney Rail Line**

  Exploratory discussions should be commenced immediately with CN Rail officials to encourage them to examine avenues to preserve the line, including the possibility of creating a short line railway.

- **Revisions to Highway Finance Policies**

  Highway finance policies should embody a direct relationship between road user charges and highway expenditures including the percentage of highway expenditures to be recovered by revenues generated by road user charges. In the establishment of these policies, the Province should give consideration to the future of the rail system.

- **Modifications to the Present Structure of Road User Charges**

  The present structure of road user charges (e.g., fuel taxes, vehicle registration fees) should be modified to better reflect the actual highway costs caused by the various vehicle categories. In particular, heavier vehicles should contribute a greater proportion of highway revenues, possibly through the introduction of third structure user charges (e.g., weight-distance taxes).

- **Establishment of Rail Intermodal Terminal in Halifax**

  A rail intermodal terminal in Halifax will improve the financial viability of the Halifax-Moncton rail line, remove truck traffic from the highways and possibly benefit shippers within the Halifax-Dartmouth area. The Province should meet

with the interested parties (e.g., CN Rail, Port of Halifax) and take appropriate steps to pursue the development of this facility.

- **Encouragement of Road and Rail Cooperation**

  The Province should facilitate improved relations between the two surface modes. The concept of the railway becoming a "wholesaler" of intermodal transportation services and the truckers becoming the "retailers" dealing directly with the shippers should be given serious consideration.

- **Reduction in Carrier Costs**

  Nova Scotia should support efforts to reduce costs for rail and road carriers where possible and practical. Rail efficiencies, particularly in regard to the important import/export container traffic should be encouraged (e.g., double-stack rail cars), perhaps with financial assistance.

- **Encouragement of Greater Provincial and Federal Policy Cooperation**

  Greater transportation policy cooperation between the various governments is clearly necessary in this era of fiscal restraint if Canada's freight transportation system is to support adequately the Canadian economy. Nova Scotia should encourage the Federal Government to consider its role and responsibilities under the National Transportation Act, 1987, particularly in respect of regional economic development. The Province should also work closely with the Federal and the other provincial governments in the development of transportation policy which will achieve the appropriate future modal roles.

Taken together, the above actions will preserve and strengthen both the essential rail and highway systems in Nova Scotia, will enhance intermodal operations, and thus will achieve more appropriate modal roles to serve the Province into the 21st century.

Yours truly,

PEAT MARWICK STEVENSON & KELLOGG

F.E. Collins
Partner

FEC:fap
Enc.

TABLE OF CONTENTS

Page

I. INTRODUCTION I.1

Study Background I.1
Study Purpose and Objectives I.5
Approach and Methodology I.6
Presentation of Study Findings I.8

II. EXISTING GOVERNMENT POLICY AND GOALS II.1

Nova Scotia Policy and Goals II.1
Policies of Other Provinces II.6
Federal Policies II.10
Summary and Commentary II.11

III. NOVA SCOTIA FREIGHT TRAFFIC PROFILE III.1

Overview III.1
Impact of Free Trade with the United States III.4
Providers of Transportation Services III.8
Nova Scotia Shippers III.11
Summary and Conclusions III.14

IV. ROAD USER CHARGES AND EXPENDITURES IV.1

Scope of the Analysis IV.2
Methodology IV.4
Results IV.8
Comparison of 1989 User Charges IV.14
Future User Charges IV.16

V. TRUCK COSTS AND RATES V.1

Historic Profile V.1
Present and Future Costs and Rates V.4

VI. RAIL SERVICE IN THE YEAR 2000 — EXISTING POLICIES VI.1

Projections of Rail-Competitive Traffic VI.1
Viability Analysis VI.6
Conclusions VI.14

VII. CONCLUSIONS AND RECOMMENDATIONS VII.1

Present Surface Transportation Situation VII.1
Future Situation Under Existing Government Policies VII.2
Issues and Constraints VII.4
Recommendations VII.7

Exhibits

			Page
I-1	Nova Scotia Rail Network	opposite	I.6
I-2	Approach	overleaf	I.6
III-1	1987 Nova Scotia Surface Freight Transportation Profile	opposite	III.2
III-2	Nova Scotia—U.S. Traffic by Major Commodity Group (1987)	opposite	III.4
III-3	Grouping of Respondents to Shipper Survey	opposite	III.12
III-4	Peat Marwick Survey of Nova Scotia Shippers (1989)	overleaf	III.12
III-5	Peat Marwick Survey of Nova Scotia Shippers (1989)	opposite	III.13
III-6	Prototype Movements	opposite	III.16
IV-1	Nova Scotia Road Revenues and Expenditures	opposite	IV.8
IV-2	New Brunswick & Manitoba Road Revenues and Expenditures	overleaf	IV.8
IV-3	Ontario & Quebec Road Revenues and Expenditures	overleaf	IV.8
IV-4	Transportation Fuel Taxes	opposite	IV.15
IV-5	Registration Fees	overleaf	IV.15
IV-6	Projected Revenues and Expenditures	opposite	IV.17
IV-7	Projected Revenues and Expenditures	overleaf	IV.17
IV-8	Projected Revenues and Expenditures	opposite	IV.18
V-1	Financial Data for For-Hire Carriers	opposite	V.2
V-2	Shipments by Class I & II Carriers	overleaf	V.2
V-3	User Charges Paid by Class I, II, III Carriers		V.3
V-4	Maximum Vehicle Weights and Dimensions in the Province of Nova Scotia	opposite	V.4
V-5	Estimated Impact of the Memorandum of Understanding on Nova Scotia Trucking Costs	opposite	V.8
VI-1	Summary of Prototype Movement Analysis	opposite	VI.4
VI-2	Projected Volumes—Year 2000 — CN Carload Traffic in Nova Scotia	opposite	VI.6
VI-3	Year 2000 Viability Statement — Truro-Sydney Line	opposite	VI.10
VI-4	Year 2000 Viability Analysis — Truro-Sydney Line	overleaf	VI.10
VI-5	Year 2000 Viability Statement — Halifax-Moncton Line	opposite	VI.12
VI-6	Year 2000 Viability Analysis — Halifax-Moncton Line	overleaf	VI.12

Appendices

A. Contacts and Documentation

B. Traffic Statistics

C. Results of Shipper Survey

D. CN Rail Plant

E. Road Revenues and Expenditures

F. Truck Costs and Rates

G. Rail Costing Methods

H. Year 2000 Viability Statements for Halifax-Moncton and Truro-Sydney Rail Lines

I. Highway Finance Bibliography

I. INTRODUCTION

This study was undertaken in response to growing concern over continued decreases in rail service in the Province of Nova Scotia and the long-term impact of this trend on the Nova Scotia economy.

STUDY BACKGROUND

The emergence of trucking as the dominant means of transporting freight has been a widespread phenomenon in North America. This growth in market share by the trucking industry has been largely at the expense of rail transportation which has experienced very little growth in overall freight volumes. For truck competitive freight, the rail mode has actually been experiencing a decline in terms of tonnage transported. The Canadian for-hire trucking sector today generates over 50% of the operating revenues of all Canadian freight modes. This excludes private trucking operations. Thus, truck transportation is the **predominant** mode of freight transportation in Canada.

The reasons for this growth in truck transportation include:

- its accessibility due to an extensive road and highway network which continues to improve and expand
- its cost competitiveness up to distances of about 1000 miles depending upon circumstances
- its ability to provide high service levels demanded by many shippers in today's highly competitive environment (e.g., just-in-time delivery), and
- its own highly competitive nature due to the large number of carriers permitted to operate which leads to the provision of high service levels at very competitive rate levels.

In consequence of the trucking industry's growth, the railways have found themselves with large networks of fixed plant, much of which is underutilized. The railways are actively pursuing rationalization of their systems through abandonment of their least productive lines.

Decline in Rail Service in Atlantic Canada

The trends in road versus rail transportation in Atlantic Canada have been even more acute than in Canada generally. Atlantic Canada has experienced a number of rail line abandonments in recent years including the complete abandonment of the Newfoundland railway and significant sections of rail line in the other three Atlantic provinces. Based on the recent decision by the National Transportation Agency (NTA), Prince Edward Island may also be without rail service by December 31, 1989.[1]

Nova Scotia has experienced a number of significant rail line abandonments and has just recently learned that the NTA has approved an application by CP Rail for the abandonment of that portion of the Dominion Atlantic Railway from Kentville to Yarmouth, a distance of over 140 miles. The abandonment will become effective in July 1990. At the writing of this report, an NTA decision is pending in regard to the abandonment of a portion of the CN Chester subdivision from Barry's Stillwater Marsh to Liverpool, a distance of 67 miles. In effect, rail service in Nova Scotia will be virtually reduced to the two CN Rail main lines of Halifax-Moncton and Truro-Sydney.

Recent Government Transportation Policy

Recent government transportation policy has also tended to accentuate the trend from rail to road described above.

Motivated by the belief that less regulation and greater reliance on market forces would support Canadian competitiveness, particularly in light of the previously deregulated United States transportation industry, the Federal Government enacted the National Transportation Act, 1987 (NTA) and the Motor Vehicle Transport Act (MVTA) both of which became effective January 1, 1988.

The NTA reshapes the freight rate negotiating framework for shippers and railways and grants new rights for shippers to access competing railways. In general this should lead to increased competition between railways and lower rail rate levels. In addition, the NTA facilitates railway plant rationalization. Railways may now abandon any line, not just branch lines, although they are limited to abandoning a maximum of 4% of their mileage annually.

[1] P.E.I. has recently sought leave to appeal the decision to the federal court.

However, since a considerable number of western branch lines are "frozen" until the year 2000, the extent of plant rationalization is expected to be commensurately greater in eastern Canada. Under the MVTA, the granting of trucking licences is made easier, thus creating even greater competition within the trucking industry and in turn against the rail mode of transportation.

At the provincial level, Canadian provinces continue to improve their highway systems. Nova Scotia is planning some additional four-laning construction including four-laning a portion of the Trans Canada Highway. In New Brunswick, legislation was passed to establish a "Highway Trust Fund" in order to provide funding for new highway construction including four-laning of the Trans Canada Highway across the Province.

In addition to highway improvements, the Provincial ministers have agreed to introduce important steps toward achieving uniform weights and dimensions of vehicles across Canada based on certain proposals put forward by the Roads and Transportation Association of Canada (RTAC) and the Canadian Council of Motor Transport Administrators (CCMTA).[2] This will result in significant increases in vehicle size and capacity in Atlantic Canada. Double trailers will be accepted on selected highways, with an overall length of 23 metres, an increase from 21 metres in Atlantic Canada. However, the ministers opted to retain the 48-foot trailer length as the maximum size which would operate in all jurisdictions (instead of the 53-foot trailer recommended by RTAC/CCMTA and now permitted in some jurisdictions). It should be pointed out that the Canadian Trucking Association continues to lobby for longer trailers, greater overall lengths and increased gross vehicle weights.

In summary, some of the above policy initiatives increase the competitive advantage of the trucking mode versus the rail mode while at the same time, facilitating rail line abandonment.

It should also be mentioned that a National Highways Policy Study is being carried out by a Steering Committee composed of officials of the Federal, Provincial and Territorial governments and RTAC. The study is being conducted in response to growing concerns for preserving Canada's highway infrastructure which is experiencing increasing traffic demands while at the same time, maintenance and construction expenditures on the network are being compromised due to budgetary constraints. The study is comprised of four phases. Phase I

---

[2] RTAC/CCMTA—**"Recommended regulatory principles for interprovincial heavy vehicle weights and dimensions"**— September 1987.

identified a national highways system, developed design and operational standards and conducted an inventory of the highway system. It was completed in October of 1988. Phase II, which comprises an economic evaluation of the benefits and costs of the National Highway System was just recently completed. The remaining phases will: examine practical means of securing funds to support the national highways system and develop options for a national highways policy.

Situation of Shippers and Carriers

The early results of regulatory reform appear promising to shippers (e.g., rate levels to shippers appear to have been reduced without any decrease in service levels provided by railways and motor carriers) according to a survey carried out by Peat Marwick[3] and the first annual review of the National Transportation Act carried out by the NTA. However, there is some concern about the future financial viability of carriers under regulatory reform.

Within the Canadian trucking industry, evidence is mounting that many motor carriers are experiencing weaker financial results (e.g., Statistics Canada reported that Canada's for-hire trucking industry showed an operating margin of just one percent on revenues for the second quarter of 1988, down from an operating margin of three percent on revenues during the previous quarter). Significant structural changes have also been occurring such as industry mergers (e.g., the recent consolidation of Canadian Motorways Ltd. and CF Kingsway Inc.) and even bankruptcies (e.g., Route Canada). However, the very nature of the trucking industry should eventually enable truckers to adjust to the new conditions.

Canadian railways, on the other hand, enjoyed improved financial results in 1988. These results appear to have been achieved through increased volumes due to a buoyant economy in 1988 because the railways reported a decreased yield on rates. Unfortunately, traffic levels are down significantly in 1989 from 1988 and weaker financial results are being reported. This will put added pressure on the railways to reduce costs and rationalize their operations and/or network (e.g., rail line abandonment).

In the course of the debate surrounding the RTAC/CCMTA proposals, CN conducted a study which showed that the railway would lose 25% of its Maritime provinces traffic if those

---

[3] Peat Marwick Consulting Group: **"Transportation Regulatory Reform in Canada, The Early Results"**, October 1988.

proposals had been adopted.[4] A loss of this magnitude would have a serious impact on railway economic viability, due to the carrier's need to earn sufficient revenues to cover all of its costs — including fixed costs. Although the RTAC/CCMTA proposals were not fully adopted, the railway continues to feel threatened.

In contrast to the traffic declines mentioned above, intermodal movements represent an area of business which has seen substantial growth for the rail mode in Atlantic Canada. Much of this traffic is associated with the Halifax containerport established in the late 1960's. Double-stack rail operations are a possibility for the inland movement of containers to/from the port. In addition, CN has encouraged the growth of domestic intermodal service (T.O.F.C.) to/from Atlantic Canada, and has established an intermodal terminal in Moncton for this purpose. With the continued growth of intermodal operations throughout North America, including containerization of domestic traffic, rail intermodal is vitally important to Nova Scotia, and represents an area of opportunity.

Although rail intermodal and truck are viable alternatives for some Nova Scotia shippers faced with the abandonment of direct rail carload service, other shippers have indicated a need for direct rail service in order to function efficiently or remain competitive in the markets that they serve as indicated by a recently completed study.[5]

In summary, the current roles and economics of the Nova Scotia surface transportation systems and associated government policy regarding the road and rail modes are in need of review, as the Province of Nova Scotia faces the prospect of continued decreases in rail service with possible detrimental consequences to its economy.

STUDY PURPOSE AND OBJECTIVES

The main purpose of this study is to assess and analyze surface freight alternatives in order to assist the Province of Nova Scotia in formulating policies which will ensure that the needs of Nova Scotia shippers, receivers and motorists are provided for into the 21st century.

---

[4] These loss estimates have been questioned and debated. See for example, **"Halifax Load Centre Cost Analysis"** study conducted by the Peat Marwick Consulting Group, March 1988.

[5] ADI Ltd., **"Implications of Changes in Rail Service on Development in Nova Scotia"**, January 1989.

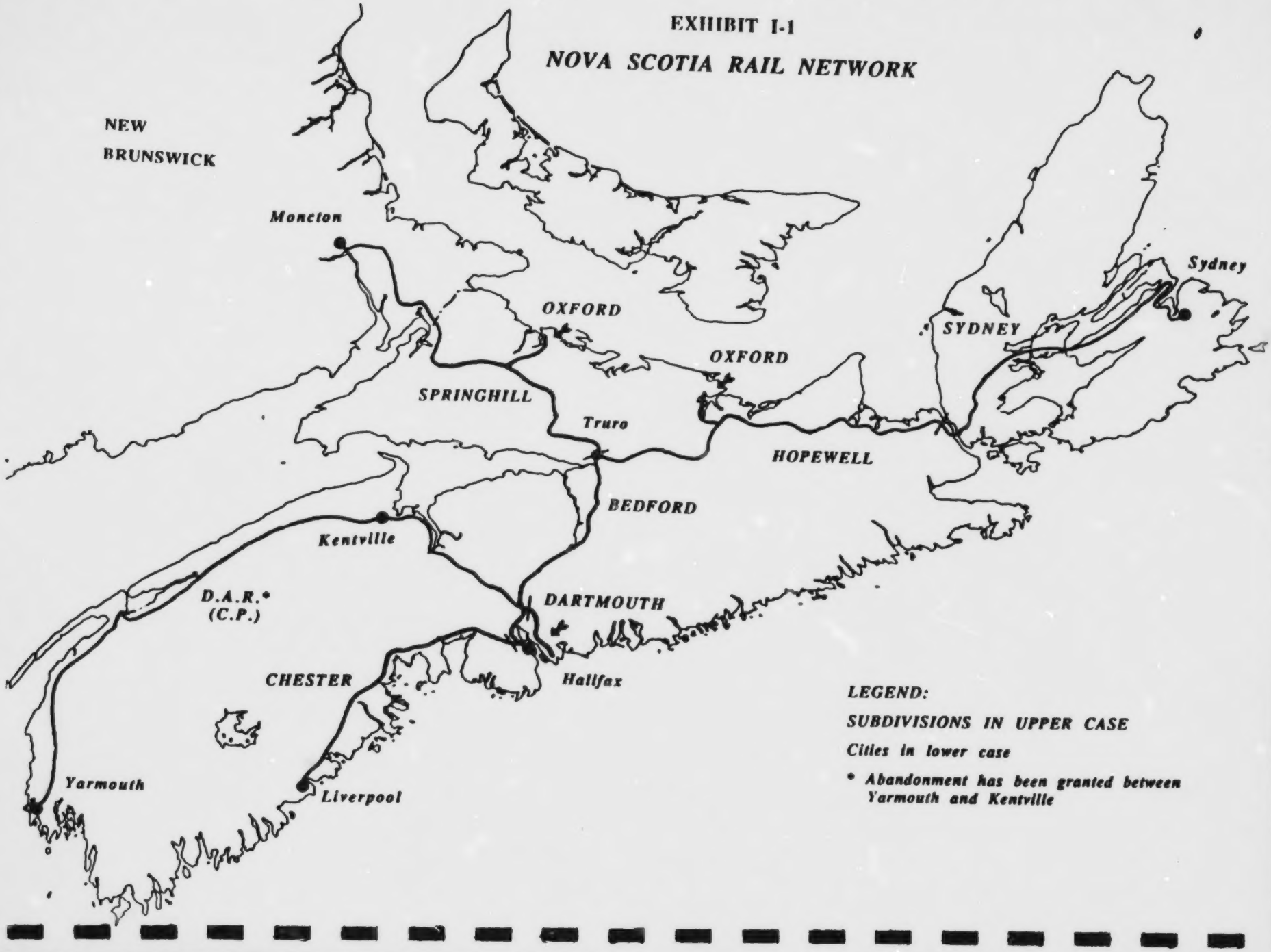


EXHIBIT I-1
NOVA SCOTIA RAIL NETWORK
NEW
BRUNSWICK
Moncton
OXFORD
OXFORD
SPRINGHILL
Truro
HOPEWELL
SYDNEY
Sydney
BEDFORD
Kentville
D.A.R.*
(C.P.)
DARTMOUTH
CHESTER
Halifax
Yarmouth
Liverpool
LEGEND:
SUBDIVISIONS IN UPPER CASE
Cities in lower case
* Abandonment has been granted between Yarmouth and Kentville

The specific objectives of the study are as follows:

- To determine if the current roles of the modes are appropriate in light of established provincial goals and priorities; in particular, economic development goals and priorities.
- To ascertain future supply and demand characteristics for surface modes within Nova Scotia for the movement of freight, given the existing policy directions of the provincial and federal governments and the continued priorities of the rail and road carriers.
- To determine if there is a more appropriate role for road and rail freight transportation modes in light of provincial goals and priorities and the steps that would be necessary to implement this role.

APPROACH AND METHODOLOGY

Consultation with a broad cross-section of business and industry (both shippers and carriers), labour, industrial development people, government officials and other interested parties is a key ingredient of this study.

The CN mainlines of Halifax-Moncton and Truro-North Sydney are the principal focus of this study in regard to future rail service and the freight movements at issue. The remaining Nova Scotia rail network is illustrated in Exhibit I-1, **opposite**.

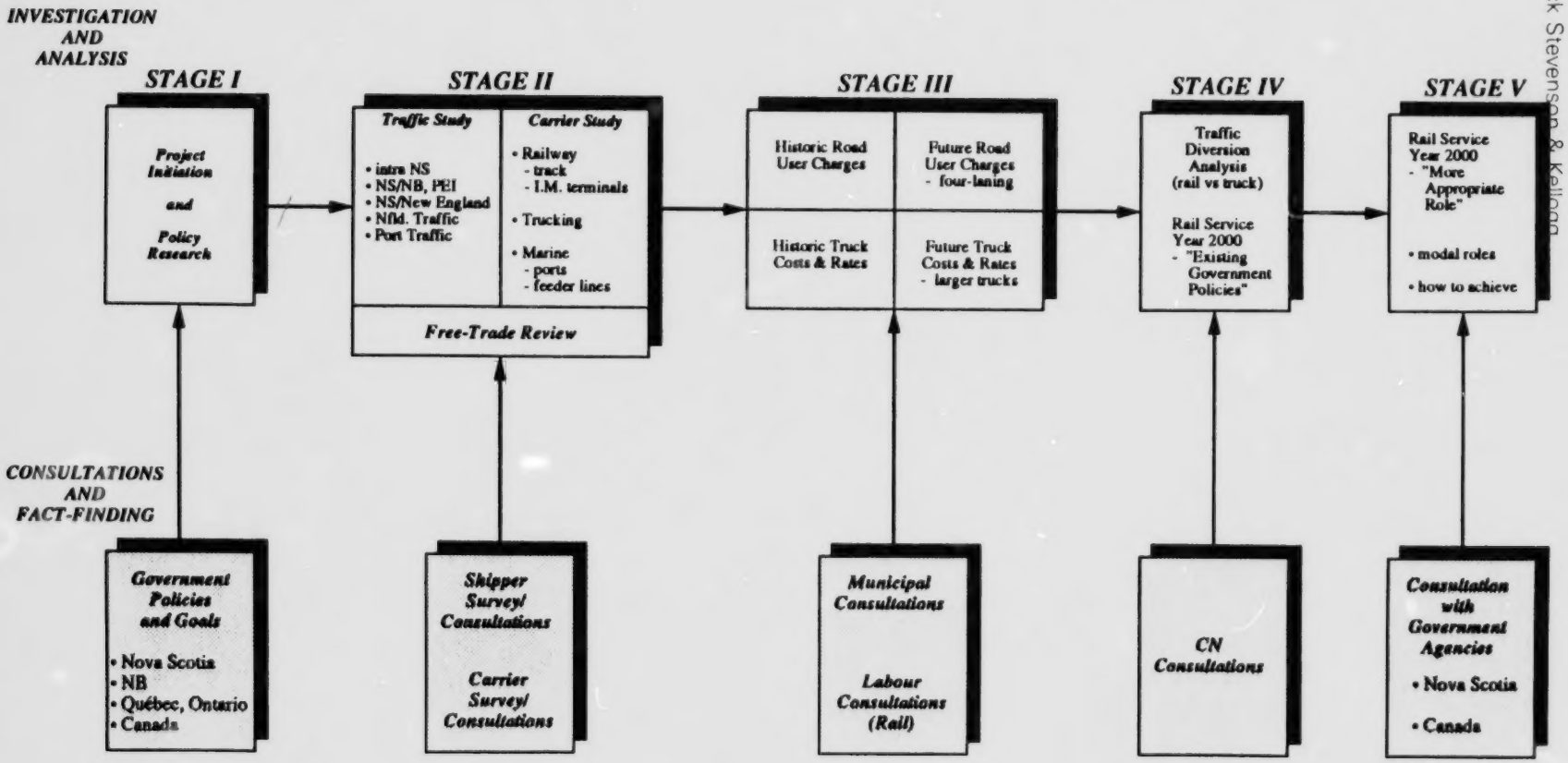
Our overall approach is illustrated in Exhibit I-2, **overleaf**. This schematic endeavors to emphasize two major streams of study activity — investigation and analysis; and consultation and fact-finding. These activity streams proceed in parallel and are mutually supportive. The study is conducted in five stages, as outlined briefly below.

Stage I incorporates project initiation activities, together with consultations and fact-finding on government policies and goals (both provincial and federal governments).

The **Stage II** work centres around investigating the current roles of the modes. This includes an in-depth investigation of the traffic movements at issue, together with carrier investigations. Related consultations and fact-finding includes a shipper survey and carrier consultations — the latter incorporates major ports and the marine mode. One result of Stage II is the specification of "prototype movements" — i.e., specific traffic movements which will subsequently be analyzed in the road vs rail transportation economics investigation.

EXHIBIT I-2

APPROACH



KPMG Peat Marwick Stevenson & Kellogg

A review of the impact of free-trade with the U.S. is conducted as part of the Stage II work — particularly in relation to the Nova Scotia/New England trade and transportation analysis.

The **Stage III** work focuses on trucking and the highway mode, and has two principal components:

i) Study of historic and present road user charges and road expenditures, together with possible future road user charges (in relation to four-laning);

ii) Study of historic and present truck costs and rates, together with the estimation of future truck costs and rates incorporating various road user charges.

Work on road user charges is facilitated by previous Peat Marwick research on this subject. Peat Marwick's proprietory truck costing model is used in analyzing the truck costs.

Consultations with municipal representatives and labour (rail) were conducted concurrently with the Stage III work.

The results of Stage III provides one of the key requirements for analyzing road/rail competitiveness.

In **Stage IV** of the study, we analyze the economics of road vs rail transportation to the year 2000 under **existing government policies** and project future rail traffic volumes based on our research findings. The extent and nature of the remaining rail service is determined as a fall-out of this work, again partly in consultation with CN. We then assess the financial viability of CN's mainlines, by estimating the resulting total rail costs and revenues. In this analysis, Peat Marwick's proprietory rail costing model is used, together with our knowledge and experience in railway finance and economics.

By comparing the resulting expected rail service against shipper needs, as determined in Stage II, we assess the extent to which provincial development goals and the needs of shippers are met, given existing government policies and priorities.

Based on the results of the previous study stages, we develop and recommend in **Stage V** of the study, future government policy and corrective actions for the Province of Nova Scotia in order to achieve the appropriate roles for the surface freight modes into the 21st century.

PRESENTATION OF STUDY FINDINGS

The findings of the study are presented in a manner which follows closely the structure of the study approach.

Chapter II summarizes the results of our Stage I work.

Chapter III presents the Stage II findings regarding the traffic profile of Nova Scotia freight movements based principally on the results of our shipper/carrier survey.

The results of Stage III are subdivided into two chapters: Chapter IV presents our review of road revenues (i.e., user charges) and expenditures and Chapter V presents our examination of truck costs and rates.

The results of Stage IV are presented in Chapter VI. It includes our analysis of the future evolution of road and rail traffic and in particular, the degree of diversion of rail traffic to other modes; and, our determination of rail service into the year 2000 under existing government policies based on our assessment of the financial viability of each the two CN mainlines. Conclusions regarding the level of rail service and the impact on shippers and economic development in Nova Scotia are also presented in this chapter.

Chapter VII presents our conclusions regarding the future of road and rail transportation in Nova Scotia under existing Federal and Provincial transportation policies and our recommended policy actions in order for the Province of Nova Scotia to achieve the appropriate roles for the surface freight modes into the 21st century. This represents the final stage of the study.

A number of technical appendices which support the study results are presented under separate cover.

II. EXISTING GOVERNMENT POLICY AND GOALS

This chapter summarizes the results of our discussions with representatives of the Nova Scotia Department of Transportation and Communications and other relevant Nova Scotia governmental bodies to identify and describe Nova Scotia's existing transportation policies as well as economic development goals and priorities. In addition, the results of discussions concerning transportation policy with representatives of the provinces of New Brunswick, Québec and Ontario and the Federal Government are also presented in this chapter.

A list of the government representatives contacted and documentation received and reviewed is presented in Appendix A.

NOVA SCOTIA POLICY AND GOALS

Although transportation and economic development policies are separately addressed in this section, the Government of Nova Scotia has clearly articulated the importance and the link of transportation to regional economic development. During the federal/provincial consultations which were held prior to deregulation of the transportation industry, the Province of Nova Scotia, along with the other Atlantic provinces, strongly endorsed the principle that national transportation policy should include regional economic development as a key objective. This concept has been subsequently enshrined in the National Transportation Act, 1987. In its response to the **Federal White Paper: "Freedom to Move"**, the Province of Nova Scotia stated the following:

> *"It is well recognized that there is a strong link between economic development and transportation. Transportation is critical to the achievement of development opportunities. Failure to provide the necessary infrastructure, adequate operations, maintenance, and replacement of facilities may retard any region's economic growth. Therefore, an adequate, safe and efficient transportation system is essential to support regional development."*

The Government of Canada, the Governments of the ten provinces and two territories have also released a position paper[1] in which two of the nine principles for regional economic development apply directly to transportation policy. One of the principles states that *"Transportation is recognized as a key to regional economic development"*. A second principle states that national policies should reinforce the goal of fair and balanced regional development including *"a transportation policy that recognizes geographical and locational difficulties"*.

The results of our interviews and research in respect of Nova Scotia policy and goals are subdivided between transportation and economic development for presentation purposes. The Department of Transportation and Communications was consulted in regard to transportation policy. Four provincial departments were interviewed in regard to economic development policy: Industry, Trade and Technology; Lands and Forests; Agriculture; and, Mines and Energy.

Transportation

Current transportation activity in Nova Scotia centres around continued improvement in the road system — in particular, completion of the 100 series highways under the auspices of the four-year $100 million Canada-Nova Scotia Highway Improvement Agreement signed in 1987. For example, the construction of the remaining sections of Highway 101 in the Annapolis Valley and in southwestern Nova Scotia is being undertaken in this agreement. Also, the four-laning of the Amherst By-Pass and the New Glasgow By-Pass is included in the Agreement.

Aside from the 100 series highways, other significant road improvements in recent years include the rebuilding of a major portion of Trunk 19 in Cape Breton, the upgrading of Trunk 16 to Canso Town, and the current construction of a new highway between Stellarton and Sheet Harbour.

In addition to improvements in the road network, truck weights and dimensions are increasing on selected highways in Nova Scotia following the agreement of the Provincial ministers which was based on the RTAC/CCMTA recommendations referred to in Chapter I. In addition to allowing double trailers with an overall length of 23 meters on selected highways, the Atlantic

---

[1] Inter-governmental Position Paper on the Principles and Framework for Regional Economic Development, June 1985.

provinces have agreed to maintain the higher maximum weight limits for 5-axle and 6-axle semi-trailer configurations resulting from the retention of the allowable tolerances. RTAC/CCMTA had recommended reductions in the gross vehicle weight limits of these semi-trailers and the elimination of tolerances. There is also pressure to increase the weight limits on secondary roads but no decision has been made in this regard. In summary, motor carriers will continue to become more competitive with rail due to the improving road network and increases in truck weights and dimensions.

The Province recognizes that adequate transportation infrastructure is necessary to ensure economic growth. However, the Province is limited in its ability to influence and achieve the appropriate roles for the surface freight modes due to the jurisdictional split along modal lines (i.e., rail is federal, road is provincial). This has led to a certain extent to the situation described in Chapter I regarding road versus rail. Recent government transportation policy at the federal and provincial levels has tended to encourage the trend of traffic diversion from rail to road by improving the competitiveness of the trucking mode and facilitating rail line abandonment. The remaining rail lines in Nova Scotia are now underutilized while at the same time there are increasing requirements for maintenance and construction of the highway system. This is putting added pressure on the Province to increase financial support for the road network which may not be necessarily the optimal use of public funds in the development of a rational and cost-effective transportation network for the Province.

The Province is, therefore, deeply concerned with the future of rail service in Nova Scotia, in particular, of CN's two mainlines: Truro to Sydney and Halifax to Moncton (this concern is evidenced by the undertaking of this study). In addition, the Province is concerned with the future of the Dominion Atlantic Railway and CN Rail's Chester Subdivision which were addressed in a separate study conducted by the Atlantic Provinces Transportation Commission entitled **"Impact of Future Changes in Railway Services in the Maritime Provinces"**. Numerous examples have been evidenced of rail traffic diverting to truck and the road network after road upgrading has occurred. The new highway from Stellarton to Sheet Harbour is a prime example. Scott Maritimes is now trucking pulp to Sheet Harbour for furtherance by barge to U.S. destinations rather than using the already under-utilized rail system. However, many Nova Scotia shippers still depend heavily on the rail system.

At the present time, transportation policy in regard to the rail mode has been to oppose all rail branch line abandonment applications due to concerns that these losses in rail service may impair the future economic development in the Province. Other policy actions to preserve the rail mode may be developed depending upon the results of this study.

Economic Development

The overall thrust of prevailing government economic policy is contained in the document: **"Building Competitiveness —A White Paper on Economic Development"**. The key focus is on enhancing the competitiveness of Nova Scotia businesses as well as attracting new investment by creating on economic climate that is conducive to economic growth and diversification. The Paper, which was issued in 1984 is now being revised and updated to reflect current global trends. Many of its underlying principles will, however, continue to guide the direction of economic policy for the Province. The overall thrust will continue to be on trade and technology. Economic diversification across the province, attraction of investment capital, human resource development, economic revitalization and community based development will all be key policy themes.

Overall, Nova Scotia's future economic policy will reflect a global view of trade and competitiveness. The objective will be to position the Province globally so that it can take advantage of, and participate in, emerging national and international trends. Transportation is expected to play a key support role in this connection.

In the past, much of the economic development expenditures have been on the resource and tourism sectors where federal/provincial agreements are in place. However, through the Atlantic Canada Opportunities Agency (ACOA), the Federal Government has attempted to broaden the scope of its regional development assistance to include the business and service sectors as well. In the future, federal expenditures for regional economic development are expected to be reduced due to overall fiscal restraint policy, although the Federal Government will continue to play a key role.

With regard to future economic developments, it is difficult to predict the probability of their occurrence and to quantify the subsequent need for rail service. Industry, Trade and Technology (IT&T) representatives did provide examples of potential developments which could require rail service as follows:

- large pulp and paper mill near Truro;
- expansion of Canexel;
- heavy engineering shop for offshore development and power plant equipment in Cape Breton;
- a plant near Port Hawkesbury to make armored vehicles and stack scrubbers;
- a new wall board mill for Louisiana Pacific in Cape Breton.

IT&T is also closely monitoring the progress of Sydney Steel Corp. (Sysco)—a heavy user of rail service. It has recently undergone a multi-million dollar modernization and has been given three years to become a profitable enterprise—otherwise, its future may be in jeopardy.

The Atlantic Provinces Economic Council (APEC)[2] also specifies a number of major potential projects including expansions of the Michelin Tire Plants at Granton, Bridgewater and Waterville and modernization of the Trenton Car Works by Lavalin.

Lands and Forests indicated some developments could lead to greater use of rail services for the movement of round wood and logs in the Province. A consolidation of sawmills is also expected which could lead to greater rail use. However, there are potential developments taking place (e.g., new mill at Sheet Harbour, new kiln in Truro) which will not require rail service. The long-term prospect for the pulp and paper industry in Nova Scotia is less than optimistic in light of added capacity in the industry across Canada and an expected downturn in demand.

The primary role of rail in the agriculture industry has been in the transportation of domestic feed grain from western Canada. However, the railways lost this business (about 175,000 tonnes) in 1987 to the marine mode via the Port of Halifax. The railways may attract some of this business back but at lower rates. The impact of the termination of the "At and East" grain and flour subsidy by the Federal Government effective July 15, 1989 will also have a negative impact on the railways. In 1988, CN Rail transported 574,162 short tons of grain and flour under the At & East program. Most of this volume is expected to disappear.

---

[2] APEC, **"Major Projects in Atlantic Canada: The 1989 Inventory"**. April 1989.

Mines and Energy mentioned the development of the new Westray coal mine located at Stellarton which will supply the nearby Nova Scotia Power Station located at Trenton with 700,000 tonnes/year of low sulphur coal starting in 1991. This will mean the elimination of the current rail movement of 300,000 tonnes/annum of Devco coal originating from Victoria Junction. Another negative development for the rail mode is the possible cessation of the rail movement of 454,000 tonnes/annum of gypsum from the River Denys quarry to Point Tupper for export by water. The higher grade gypsum is expected to be depleted within five years at River Denys and the lower grade gypsum may not be mined. Higher grade gypsum may be moved by road from a new mine site. On the positive side, there is the possibility of the development of a major limestone deposit near Whycocomaugh which could be shipped by rail to Port Hawkesbury. Secondly, the Point Tupper No. 1 generating station may be re-opened by the Nova Scotia Power Commission which could be converted to use coal as the fuel source.

Overall, the results of our discussions indicate that future economic developments are still at the tentative stage. The only major provincial and federal government policy which would have a significant impact upon rail traffic volume (but in a negative fashion) is support of the development of the new coal mine at Stellarton.

POLICIES OF OTHER PROVINCES

The transportation policies of the provinces of New Brunswick, Québec and Ontario are summarized below.

New Brunswick

The Government of New Brunswick's transportation policy is to create the situation which provides New Brunswick shippers with the cheapest possible transportation costs. New Brunswick tries to provide a *"level playing field"* for the railways and truckers who compete in the transportation marketplace. However, public funds are directed towards the road network again due primarily to jurisdictional considerations.

At the present time, New Brunswick does not see any threat to its main rail lines because rail volumes have been stable although rail services are becoming more specialized (e.g., CN Laser

Service to Moncton, potash movements from Sussex to Saint John). The abandonment of the Newfoundland railway has had little effect because the volume of Newfoundland traffic remained constant through New Brunswick, although now the majority of it is routed through Halifax instead of Sydney.

New Brunswick essentially accepts the Atlantic Provinces Transportation Commissions' predictions regarding rail abandonments (1,050 kms over the next five years), although the Government will officially oppose all abandonments. The rail lines in question are carrying very little traffic. The Province does not feel that CP Rail's line through the State of Maine or CN's east coast line could possibly be abandoned. However, these lines would become less viable if VIA Rail's passenger services were discontinued.

The New Brunswick Green Paper on highways[3] is now basically official policy. It has been discussed in public hearings and received general support. Legislation has been passed to establish a "Highway Trust Fund" which is to be devoted to upgrading the arterial highway system. To finance the upgrading program, an ad valorem tax has been introduced. However, the net effect is about the same. The trust fund is significant in that it is the only direct link between fuel tax revenues and roads. It should be noted that the trust fund is for arterial **road construction** purposes only; not **maintenance** of the existing road system.

The total capital cost of New Brunswick's arterial highway improvement program is estimated to be about $2 billion (1988 dollars) to be spent over a 15-year time frame. New Brunswick is asking the Federal Government to contribute 90% to the upgrading of the Trans Canada Highway to four lanes including the connecting links to Saint John (i.e., from Sussex and from Fredericton). This would result in total federal participation of over $1.3 billion. The reasoning behind the 90/10 cost sharing arrangement is based on past precedents of cost-sharing in the Atlantic Provinces for the Trans Canada Highway and examples of Federal/State cost-sharing arrangements in the United States. Discussions are currently taking place with the Federal Government but no commitments have yet been settled upon.

With regard to truck weights and dimensions, New Brunswick was a signatory to the National Agreement and has implemented increased weights and dimensions for trucks. However, in line with Nova Scotia, there will be no decrease in the maximum weight limits for the 5-axle and 6-axle tractor trailer units as originally recommended by RTAC.

---

[3] **"Adequate Highways — A Key to Regional Economic Development"**, August 1988.

New Brunswick has no plans to change the highway user fee structure other than the introduction of the highway trust fund tax described above. The Government feels a weight-distance tax is too difficult to administer and it has also just increased all vehicle registration fees by 15%. The Government questions the philosophy that highway costs should be recovered from commercial users because **all** users benefit, including property owners along the highway. Secondly, in lesser populated areas like the Maritimes, it would generally mean higher transportation costs for shippers.

In summary, New Brunswick's policies reflect continued support for the road system with less concern expressed for the future viability of its rail network.

Ontario

The general surface transportation policy of the Ontario government is to ensure that there is a **modal choice** for shippers, wherever possible.

At present, Ontario has a lot of railway plant to the point that there is much duplication of main lines between CN and CP. Ontario wants to see CN and CP remain viable in Ontario and the two railways should be allowed to rationalize their systems and become more efficient. However, Ontario is not ready to fund or subsidize CN or CP (Ontario is already indirectly subsidizing the Algoma Central Railway). Ontario considers that both Canadian railways must try to overcome their internal cost problems (e.g., crew sizes, work rules, etc.). With regard to railway abandonment, nothing crucial has occurred or is anticipated in the near future.

Ontario has effectively adopted the agreed to truck weights and dimensions. Although 53-ft. trailers were not accepted by Ontario (due to a strong lobby by the Ontario Trucking Association) at the time, there is a good possibility that 53-ft. trailers will be allowed in Ontario within two to five years. A number of U.S. states now permit 53-ft. trailers as do the western Canadian provinces.

Ontario is experiencing a good deal of pressure to expand/upgrade its road system to four lanes. It has estimated that $1.6 billion should be spent on expansion type improvements over the next ten years on links in Ontario's National Primary Highway System as defined by Phase I of the RTAC National Highway Policy Study. Ontario is currently spending about $5 million/year just to correct tire rutting caused by overweight vehicles.

All revenue generated by road user charges now goes to the consolidated revenue fund and there will be no change in this policy. Ontario now collects about $1.7 billion/year in fuel taxes and licences which is greater than the annual expenditures on maintenance and construction of provincial highways. It seems unlikely that Ontario will impose a new road user tax regime (e.g., weight/distance) such as the one advocated by CP Rail. Attempts have been made to conduct an authoritative highway cost allocation study, but Ontario could never get agreement between the Ontario Trucking Association and the railways on the terms of reference. There is a very strong trucking lobby in Ontario.

Québec

Québec has no official policy regarding surface transportation. Québec is facing the possibility of major rail line abandonments and plans to oppose any abandonment applications.

After many years of highway expansion, Québec is now in a period of retrenchment to maintain and upgrade its existing highway system to satisfactory safety standards (e.g., it is estimated that 40% of the bridges in the province have serious defects). In addition, there are imposed budgetary constraints. The annual transport budget of $1.7 billion is currently evenly divided between mass transit and the road system. The road budget is for both maintenance and new construction. Capital projects in regard to highway extension or rehabilitation are limited to the Montreal area and isolated parts of the highway system particularly in the lower south shore of the St.Lawrence River (e.g., Rimouski area) and in the Gaspé region. Québec estimates that it is ten years away from four-laning the Trans Canada Highway between Rivière-du-Loup and the New Brunswick border.

With regard to truck weights and dimensions, Québec also allows truck-trains ("trains-routiers") which are allowed to be up to 33 metres in length (e.g., two 48-ft. trailers) on designated routes. These truck-trains operate 9 months/year from March 15 to December 1. They have been operating on an experimental basis and results have been generally positive to date. Any change in truck weights and dimensions (e.g., authorization of 53-ft. trailers) will be made in close collaboration with Ontario as well as in recognition of developments in the United States (e.g., New England, New York). It should be noted that Québec has recently installed 33 new weigh scales across the Province to better police allowable truck weights. Weights have been a problem in the past.

Road user charges contribute to the general revenue fund. There is no connection between road user charges and the costs of road maintenance and construction.

FEDERAL POLICIES

Budget constraints will play an important role in Federal Government transportation policy (e.g., the elimination of the "At and East" grain and flour subsidy and the severe budget cuts imposed on VIA Rail by the recent federal budget). Other very important subsidy programs to the Atlantic Provinces such as MFRA and ARFAA have also been scrutinized. Regional development programs which are now the source of current federal highway funding, may also be reduced. The Federal Government is, however, paying a significant portion of the National Highway Policy Study.

The National Transportation Act (NTA) will be followed in regard to rail line abandonment. It was pointed out that the NTA does provide for provinces to subsidize rail lines themselves if they wish to keep a rail line. However, due to concern about the impact of rail line abandonment on the economic development of a region or province, the National Transportation Agency has completed a "Criteria for Essential Rail Network Study" which involved consultation with the provinces. The results of this study are available in the 1988 Annual Review of the NTA. Suggested criteria, procedures and policies are outlined. Rail lines with the following characteristics might be considered part of an essential network:

- serving shippers whose needs cannot be practically or economically met by alternative carriers or forms of transportation;
- serving areas with forest resources or mineral deposits (e.g., gypsum, coal) with *clearly identified* development potential dependent solely on available rail transportation;
- serving national ports (e.g., Halifax);
- serving *clearly identified* industrial development needs, such as where new commitments to sunk costs have been made by industries (e.g., Sysco) dependent on rail;
- required to provide effective competition in transport;
- required in the Maritimes to maintain a basis for Newfoundland freight rates.

The Transport Canada representatives stated that the provinces can take initiatives to redirect traffic from road to rail if they wish to preserve rail service. The provinces are considered to be partially responsible for the diversion of traffic from rail to road due to their emphasis on highway spending with little regard to railway viability.

The federal representatives felt that vehicle weights and dimensions issue should remain stable for a while now. However, they predicted that the 53-ft. trailer or the 25-metre overall length will probably be introduced in Ontario by about 1995.[4]

SUMMARY AND COMMENTARY

Federal and Provincial transportation policy at the present time tends to encourage the traffic diversion trend from rail to road by improving trucking competitiveness in relation to rail and facilitating the abandonment of rail lines by the railways.

At present, provincial government policy is still highly focussed on the highway system and the associated truck mode with little regard to the impact on the viability of the rail system. Only Nova Scotia, and to a lesser extent Québec, appear concerned at this time with rail line abandonment and its impact upon their respective economies. Nova Scotia is also the only province which does not levy a provincial tax on locomotive diesel fuel. Overall, government policy in regard to vehicle weights and dimensions seems resolved for the time being.[4] However, the issue of road user charges is still to be addressed. New Brunswick has taken some initiative with regard to a highway trust fund but on the other hand, is still highly supportive of the road system. Every province has its own particular transportation situation and it is probable that surface transportation policies will be developed to reflect these individual situations within each province.

The Federal government, which historically has held authority and responsibility for the rail mode is stepping back from some of its financial responsibilities and suggesting that the provinces might assume some of these responsibilities. In addition, Federal government spending on subsidy programs and on regional development is being constrained.

---

[4] On November 23, 1989, the Ontario Government endorsed new truck lengths of 25 metres for tractor trailers and 53 feet for trailers.

As a result, the provinces may have little choice but to take a greater role in dealing with the rail versus road issue including increased financial support for the freight transportation system. This implies not only increased maintenance and construction expenditures for the road network but also possible subsidies for the rail mode by the provinces. However, budgetary constraints at the provincial level may restrict the extent to which the provinces can support the freight transportation system.

The result may be that present government policy combined with budgetary constraints at the federal and provincial levels may lead to serious deterioration of Canada's and Nova Scotia's freight transportation system in the longer term. The National Highway Policy Study is a sign of this concern.

III. NOVA SCOTIA FREIGHT TRAFFIC PROFILE

This chapter presents the results of our investigation into the current roles of the transportation modes (i.e., rail, truck and marine) serving the Nova Scotia economy from the viewpoint of both the users and providers of transportation services. The impact of the Free Trade Agreement with the U.S. on existing transportation patterns and services is also examined in this chapter.

OVERVIEW

The role of the transportation modes moving freight generated by the Nova Scotia economy has been constantly evolving over the years. The findings of the recently completed ADI Study referred to in Chapter I indicated that for-hire trucking tonnages in Nova Scotia increased by approximately 79 percent over the past decade while rail tonnages (i.e., CN and CP) increased by only 19 percent. As a result, for-hire trucking increased its market share by 6 percent in terms of tonnage and 7 percent in terms of revenue to reach market shares of 41 percent and 59 percent in terms of tonnage and revenue respectively by the year 1984.[1]

The marine mode has also been evolving, particularly in regard to containerized cargo at the Port of Halifax which has more than doubled its container traffic over the past five years. The Port handled more than 3.5 million tonnes[2] of containerized cargo in 1988, an increase of 26.7% over 1987. The Port is continuing to experience growth and expects to handle over 4 million tonnes in 1989.

The purpose of this section of the chapter, however, is to deal with the **present** role of the freight traffic modes. Previous studies should be referred to for further details in regard to the evolution of the modes in the past.

---

1 Exhibit 4.1, Page 4.8 of the study.

2 Note: Throughout this chapter, volumes are expressed in **metric** tonnes.

EXHIBIT III-1

1987 NOVA SCOTIA SURFACE FREIGHT TRANSPORTATION PROFILE (METRIC TONNES — 000's)

SURFACE MODE	TO NOVA SCOTIA	FROM NOVA SCOTIA	WITHIN NOVA SCOTIA	TOTAL
CN Rail[1] — Carload	1,373	1,018	3,998	6,389
— Container[2]	1,360	1,058	Ø	2,418
— Piggyback[3]	177	99	Ø	276
Sub-total:	2,910	2,175	3,998	9,083
DAR (CP RAIL)[4]	12	Ø	1,614	1,626
DEVCO	Ø	Ø	3,200	3,200
FOR-HIRE TRUCK[5]	1,668	1,273	4,468	7,409
PRIVATE TRUCK[5]	312	211	1,789	2,312
TOTALS:	4,902	3,659	15,069	23,630

1 Source: CN Rail. Excludes Newfoundland traffic.
2 Assumes 9.42 tonnes/loaded import TEU, 11.19 tonnes/loaded export TEU.
3 Plan II, Assumes 20 tonnes/piggyback trailer.
4 Source: DAR shortline study, September 1988.
5 Source: Statistics Canada, Trucking in Canada, Catalogue No. 53-222, 1987.

Surface Transportation

Exhibit III-1, **opposite**, attempts to present a complete profile of the surface freight transportation situation in Nova Scotia for the year 1987. Thanks to the cooperation of CN Rail, a relatively more accurate picture of the role of the surface modes in transporting Nova Scotia freight traffic can be presented.

The most interesting finding of these results is that the rail mode (excluding DEVCO and CN Rail piggyback traffic) has maintained its 59 percent market share of the common carrier surface transportation market since 1984. It should be noted that the volumes presented in Exhibit III-1 include both Canadian and U.S. traffic. Statistics Canada is making available U.S. trucking traffic data in a similar format as Canadian trucking traffic data commencing in 1987.

Piggyback traffic is now becoming a significant surface mode of transport for Nova Scotia freight. At the present time, however, all originating or terminating Nova Scotia piggyback traffic is moved over the road to and from the CN piggyback terminal located at Moncton, New Brunswick.

It should be noted that Newfoundland traffic is not included in the CN Rail data because there have been significant changes to the distribution patterns of traffic to and from Newfoundland since the abandonment of the Newfoundland railway in late 1988. It is estimated that CN currently transports approximately 300,000 tonnes of containerized cargo to and from Newfoundland through its subsidiary Terra Transport.

Further background details in regard to for-hire trucking traffic data and CN Rail traffic data are provided in Appendix B. Table B-1 provides a breakdown of 1987 for-hire trucking volumes and revenues by origin and destination province as well as the U.S. In similar fashion, Table B-2 provides a breakdown of CN Rail carload and container traffic data. The revenue data confirm that the rail mode has maintained its share of the Nova Scotia common carrier transportation market over the past few years. CN Rail carload and container traffic revenues represented 42 percent of the combined revenues of CN Rail traffic and for-hire trucking revenues in 1987 as follows:

NOVA SCOTIA FOR-HIRE REVENUE ($000's)[3]

	To	From	Within	Total
CN Rail	120,119	93,065	12,650	225,833
For-Hire Trucking	155,311	81,267	71,973	308,551
Totals:	275,430	174,332	84,623	534,384

One final note is that Nova Scotia highways also carry about 1.8 million tonnes of Newfoundland freight which is transported by truck to and from the mainland (excluding Nova Scotia).

Marine Transportation

Marine transportation also plays a very important role in moving freight traffic to and from Nova Scotia. In 1987, marine traffic volumes handled by Nova Scotia ports were as follows:

VOLUMES (TONNES 000's)

	Loaded	Unloaded	Total
Domestic	4,056	2,071	6,127
International:			
U.S.	6,949	376	7,325
Overseas	3,077	6,265	9,342
Sub-totals:	10,026	6,641	16,667
Totals:	14,082	8,712	22,794

It should be noted that domestic volumes would include some duplication between Nova Scotia ports (e.g., some gasoline and diesel fuel loaded aboard vessels at Halifax destined for other Nova Scotia ports) but the volumes are not significant. It should also be recognized that there is duplication of traffic volumes between the surface modes and the marine mode since port traffic often requires inland transportation by truck or rail to and from the port.

A significant amount of the domestic volumes handled involves the distribution of gasoline and fuel oil from Halifax to other ports in the Atlantic Region. Other significant domestic

---

[3] Excludes subsidy payments.

EXHIBIT III-2

NOVA SCOTIA — U.S. TRAFFIC BY MAJOR COMMODITY GROUP (1987) (TONNES)

A. SOUTHBOUND (to U.S. Destinations)

1. Fish and Marine Products

	Rail	Road	Water	Total
New England	nil	19,046	n/a	n/a
Middle Atlantic	nil	3,764	n/a	n/a
South Atlantic	nil	162	n/a	n/a
Other States	nil	1,899	n/a	n/a
Total traffic	nil	24,871	7,936	32,807

2. Forest Products (mainly newsprint and pulp)

	Rail	Road	Water	Total
New England	n/a	10,393	n/a	n/a
Middle Atlantic	n/a	9,594	n/a	n/a
South Atlantic	n/a	8,363	n/a	n/a
Other States	n/a	2,008	n/a	n/a
Total traffic	532,240	30,358	119,171	681,769

3. Secondary Manufacturing (largely Automotive Products)

	Rail	Road	Water	Total
New England	n/a	1,500	n/a	n/a
Middle Atlantic	n/a	1,142	n/a	n/a
South Atlantic	n/a	5,288	n/a	n/a
Other States	n/a	2,115	n/a	n/a
Total traffic	33,440	10,045	32,762	76,247

4. Crude non-metallic minerals other than coal and petroleum (largely gypsum)

	Rail	Road	Water	Total
New England	nil	nil	n/a	n/a
Middle Atlantic	nil	nil	n/a	n/a
South Atlantic	nil	nil	n/a	n/a
Other States	nil	nil	n/a	n/a
Total traffic	nil	nil	6,337,275	6,337,275
Total other traffic	nil	7,992	451,919	459,911
GRAND TOTAL	565,680	73,266	6,949,063	7,588,009

EXHIBIT III-2 (cont'd.)

B. NORTHBOUND (from U.S. Origins)

1. Food, Feed, Beverages and Tobacco (SCC Codes 01-19, largely fruits, vegetables and juices)

	Rail	Road	Water	Total
New England	n/a	9,495	n/a	n/a
Middle Atlantic	n/a	3,919	n/a	n/a
South Atlantic	n/a	793	n/a	n/a
Other States	n/a	1,761	n/a	n/a
Total traffic	5,372	15,968	20,848	42,188

2. Crude Materials (SCC Codes 20-29, largely waste and scrap materials)

	Rail	Road	Water	Total
New England	n/a	13,903	n/a	n/a
Middle Atlantic	n/a	2	n/a	n/a
South Atlantic	n/a	1	n/a	n/a
Other States	n/a	5,303	n/a	n/a
Total traffic	22,830	19,209	76,145	118,184

3. Fabricated Materials (SCC Codes 30-49, chemicals, non-metallic mineral basic products, etc.)

	Rail	Road	Water	Total
New England	n/a	2,519	n/a	n/a
Middle Atlantic	n/a	8,012	n/a	n/a
South Atlantic	n/a	3,475	n/a	n/a
Other States	n/a	5,346	n/a	n/a
Total traffic	20,093	19,352	268,309	307,754

4. End Products (SCC Codes 50-99, rubber tires and tubes from the south etc.)

	Rail	Road	Water	Total
New England	n/a	1,767	n/a	n/a
Middle Atlantic	n/a	1,006	n/a	n/a
South Atlantic	n/a	8,789	n/a	n/a
Other States	n/a	3,525	n/a	n/a
Total traffic	3,357	15,087	10,305	28,749
GRAND TOTAL	51,652	69,616	375,607	496,875

Source: Statistics Canada (Road and Water tonnage); CN Rail (Rail tonnage as estimated from carload data).

commodity movements are gypsum from Halifax to central Canada, salt originating in Pugwash to numerous Canadian destinations and the traffic carried by the North Sydney-Port-aux-Basques ferry.

Approximately 75% of the marine traffic destined to the U.S. represents gypsum. Salt, fuel oil and newsprint are other significant commodities moving to the U.S., principally along the Atlantic coast.

Halifax handles over 98 percent of the international marine tonnage unloaded at Nova Scotia ports. Crude petroleum, which is destined for the local refineries, represents about 71 percent of the unloaded volume at the Port of Halifax. The 2.7 million tonnes of containerized cargo handled at Halifax in 1987 represented about 24% of the total international tonnage (11.5 million tonnes) handled by Nova Scotia's principal port in that year.

IMPACT OF FREE TRADE WITH THE UNITED STATES

The extent to which improved market access under Free Trade will impact transportation in terms of traffic volumes, modal split and the routings of goods to/from the U.S. and Central Canada, will depend largely on currency values and on the collective response of producers and consumers in both countries to perceived market opportunities. Analysis of this issue focussed primarily on the major Nova Scotia commodity groups likely to benefit from reduction and removal of current U.S. impediments to trade, including tariffs, quotas, countervail and other actions arising out of pre-existing U.S. trade remedy law. However, we also looked into the potential for substitution of cheaper U.S. products for those hitherto provided locally or brought into the Province from elsewhere in Canada.

Information used in this analysis was obtained from shipper surveys, from Statistics Canada, from CN Rail and from various analyses carried out by the Department of Industry, Trade and Technology and other research organizations.

Major Traffic Flows

The 1987 (i.e., pre-FTA) tonnage statistics for the rail, road and water modes is shown in Exhibit III-2, **opposite**. Over 8 million tonnes of goods were exchanged during that year of which 7.6 million tonnes travelled south and 0.5 million tonnes were imported.The dominant **southbound** (export) direction was largely made up of gypsum, newsprint, wood pulp and

other forest products, automotive products and fish and marine products. The more modest **northbound** (import) tonnage was much more heterogeneous, consisting of U.S. chemicals, ores, waste and scrap materials, fresh fruits and vegetables, animal feeds and a variety of other commodity groups.

Water was by far the predominant mode in Nova Scotia - U.S.trade during that year (over 90% of total tonnage exchanged between Nova Scotia and the United States moved by water), primarily as a result of the huge gypsum movements out of Dartmouth, Hantsport, Point Tupper and Little Narrows. However there were also large water movements of other bulk minerals from Port Hawkesbury, Mulgrave and Pugwash as well as gasoline and fuel oil from Dartmouth. Bowaters also moved over 100,000 tonnes of newsprint from Liverpool to the United States in 1987.

In sum, over 91% of southbound tonnage (over 6.9 million tonnes) and over 75% of northbound tonnage exchanged between the two countries moved by water.

Rail volume amounted to 617,332 tonnes in 1987 (7.6% of all traffic exchanged with the U.S.). This volume was also primarily (nearly 92%) a southbound movement, made up of 565,680 tonnes of newsprint, wood pulp and automotive products.

Road (albeit representing only 1.7% of the total carriage) was the most evenly balanced of the modes serving the Nova Scotia - U.S.connection during 1987. This mode carried 73,266 tonnes south and returned with 69,616 tonnes of diverse commodities according to Statistics Canada trucking surveys.

Exports by road included over 30,000 tonnes of the higher valued paperboard, lumber and miscellaneous forest products, nearly 25,000 tonnes of fish and other marine products, and over 10,000 tonnes of automotive and miscellaneous manufactured products.

Northbound truck traffic was more heterogeneous, with waste and scrap materials (the largest single item), miscellaneous food items, and intermediate and final manufactured products being the most prominent categories in terms of tonnage.

Impact of Free Trade on Key Commodity Groups

Studies undertaken by the Department of Industry, Trade and Technology suggest that The Canada - U.S. Free Trade Agreement (FTA) promises greater access for Nova Scotia exports and reduced costs for a greater variety of consumer products. Potential benefits are expected to concentrate within a relatively limited range of export commodity groups rather than on the more heterogeneous import sector.

The potential stimulus to Nova Scotia export industries will be largely indirect however, that is to say arising more as a result of increased investment in Nova Scotia resource-based industries than from the elimination of the U.S.tariff. This is because almost all locally sourced resource products currently moving into U.S. markets are already free of tariffs, including the important gypsum traffic. On the other hand, reduction of the threat of countervail for such goods as forest and automotive products (which have also moved freely for many years) is expected to have a positive impact on investor confidence. Thus, additional value-added processing of Nova Scotia resources is likely to be forthcoming as a result of the FTA. The recent decision of Louisiana Pacific Corp. to construct a gypsum wallboard plant at Port Hawkesbury may be an example of this (The U.S. tariff on wallboard of 2.4% ad valorem before the FTA is being reduced over 10 years).

The FTA also promises long term growth opportunities to Nova Scotia fish processors provided current problems with respect to the supply of adequate fish stocks can be successfully overcome. (There is currently a moratorium on new plant licences in the Province and there have been a number of plant closures in 1989). Tariffs on processed fish products will be phased out, some over five years and others over ten years. Prospects for development of the oil and gas fields offshore Nova Scotia may also be enhanced.

The prognosis on the import side is for some increased competition from U.S. manufactured and semi-manufactured goods. However analysis by the above mentioned studies suggests that the FTA will save the average Nova Scotia family only about $122 a year, a relatively modest 0.7% of current family expenditures of $17,092. This conclusion is a function of the volumes and types of goods currently exchanged between the two regions.

On the negative side, the Peat Marwick shipper survey revealed some concern by Devco, Sydney Steel and Hawker Siddley about the future of Canadian regional development

programs, including transportation subsidy programs. These firms stand to lose more than just U.S. markets (none of them is currently a major user of cross-border transportation) should this become an issue in the future.

Impact of Free Trade on Transportation Systems

The impact of the FTA on volume, routing and modal share of cross-border traffic will depend on structural trends, particularly in the all-important resource sector. Increased shipments of gypsum in the form of value-added wallboard for example, would reduce overall volume and introduce the possibility of intermodal competition (gypsum currently moves south by water). However the scope for such structural shifts is difficult to determine, particularly since, in the case of gypsum, there is a possibility of Nova Scotia gypsum returning north in the form of U.S. made wallboard as the higher Canadian tariff on this product (9.4% vs. 2.4%) is progressively removed over the ten year transition period. However the following scenario is suggested by analysis of the major commodity categories.

Cross-border traffic **volumes** are not likely to show significant change as a result of the FTA. However the mix of commodities and the directional balance may be affected. In the southbound directional there could be some substitution of resource products such as fish and (possibly) gypsum, in value-added form. In the northbound direction the tendency will be for the entry of more U.S. food and manufactured products to compete with Canadian produced equivalents. The main beneficiaries are likely to be cross-border truckers (both U.S. and Canadian) rather than rail since they are better placed to take advantage of higher imports of U.S. manufactured products as well as increased exports of Nova Scotia processed fish (supply permitting) and other value added items.

The trend of **modal share** is thus likely to move in favour of **truck volume** over Nova Scotia highways (albeit at the expense of water rather than rail). However the impact of the FTA on these carriers is expected to be relatively modest and change will be gradual as the Agreement is implemented. **Marine** feeder services between Nova Scotia and the United States appear adequate to handle present traffic volumes which are not expected to change markedly in the future. **Rail volume** can increase as a result of the FTA only to the extent that Halifax is able to establish itself as a distribution centre for waterborne trade between the U.S. and Eastern Canada as a whole. For example the possibility of using the port of Halifax to supply U.S. fruits and vegetables (using the port of Jacksonville) to central Canadian

markets was looked at by Halterm some years ago. However the study showed that such a routing was not feasible owing to time and service constraints and the advent of the FTA is not likely to change this situation for these or for any other products.

PROVIDERS OF TRANSPORTATION SERVICES

This section presents the results of meetings and discussions with carriers who provide rail, trucking or marine services in Nova Scotia. The purpose of these discussions was to learn about their future plans or requirements as well as to elicit their opinions regarding current government transportation policy and regulations. The carriers were also an important source of traffic data when the information was not readily available in the public domain (e.g., CN Rail).

The results of these discussions are individually summarized for each of the three modes of transport. A list of the contacts is provided in Appendix A.

Rail

The cooperation of CN Rail is crucial to the success of this study and a number of meetings/discussions were held in order to provide information regarding:

- traffic data;
- rail operations and services;
- rail plant including intermodal facilities
- future plans or initiatives of relevance to the study.

A description of the CN Rail plant for each of the two main lines (i.e., Halifax-Moncton, Truro-Sydney) is presented in Appendix D. In general, both lines are considered in satisfactory condition for the current traffic being handled. The Truro-Sydney line in particular is underutilized versus what the line could support in terms of traffic volume.

A tour was conducted of the intermodal facility at Moncton, New Brunswick. This centre currently serves as the intermodal hub of the Atlantic Provinces for piggyback traffic to and from inland North American markets. Special intermodal or "Laser" trains operate between Toronto/Montréal and Moncton on a strict schedule. The second Laser train was added in March of 1989 in response to increasing traffic volumes. Transit time between Toronto and

Moncton is approximately 24 hours (18 hours for Montréal) and the entire Laser train of about 105 platforms can be turned around (i.e., unloaded and then reloaded) including switching operations in about six hours. With the second Laser train, the terminal is becoming very busy and CN Rail is currently studying the possibility of establishing an intermodal facility in Halifax to handle Nova Scotia piggyback traffic and Terra Transport containers to and from Newfoundland.

With the abandonment of the Newfoundland railway, there has been a significant shift in Terra Transport traffic volumes from the North Sydney-Port-aux-Basques route to the Halifax-St.John's route. Approximately 26,000 TEU's or 75% of Terra Transport's container volume now moves via Halifax whereas in 1987, almost 80% of the containers to Newfoundland moved via North Sydney. This shift is further contributing to the already questionable economic viability of the Truro-Sydney rail line.

CN Rail has expressed some concerns with government policy — particularly adoption of increased weights and dimensions for trucks which they believe will lead to a loss in rail traffic to the truck mode. The competitive situation of rail versus road into the future is addressed in detail later in the report.

Truck

In contrast to CN's opinion, the trucking industry does not foresee any significant impact on the road versus rail competitive situation due to the increases in truck weights and dimensions. Deep concern was expressed that reductions in axle loadings for five- and six-axle trucks as recommended would have had serious negative impacts on Atlantic Canada shippers. As a result, the Atlantic Provinces Transportation Ministers have agreed not to reduce the axle loadings for these vehicles. Trucking representatives indicated that the larger truck configurations recently adopted in the Maritimes, are not permitted on secondary roads where many shippers are located.

Although truckers are satisfied with the highway system in Nova Scotia, they believe four-laning is necessary to keep Atlantic Canada industry competitive in North American markets. Further increases in weights and dimensions (e.g., twin 48'-trailers, 53'-trailers) were also mentioned as necessary in the longer term.

The New Brunswick highway system, however, came under heavy criticism. Truckers are willing to accept higher user charges if the additional revenues generated are used for highway improvements which benefit the road users in a cost-effective manner. Such, they contend is not the case in New Brunswick.

Relations with CN Rail varied among the trucking respondents. Some work with CN Rail in providing piggyback P&D services. Some truckers have confidential contracts with CN Rail to move their trailers between Central Canada and Moncton. Criticisms of CN Rail included its apparent low pricing policy — both piggyback and Terra Transport, CN's use of brokers to haul piggyback trailers between Moncton and Halifax rather than use common carriers, and generally its desire to remain in the retail market rather than leaving the marketing and P&D operations to the truckers (i.e., CN should become a wholesaler of transportation services). Surprisingly, truckers were favourably disposed to the establishment of an intermodal terminal in Halifax. It would be beneficial for Nova Scotia shippers even though it could mean some loss in P&D business to and from the Moncton terminal.

As indicated above, truckers do not see the need to increase user charges unless there are significant improvements in the road system which are beneficial to them (e.g., four-laning). The Federal fuel tax, as expected, came under criticism for the low percentage of the revenues generated that actually flows back to improve the highway system.

Marine

The Halifax-Dartmouth Port Development Commission is deeply concerned about the rail versus road issue. It recognizes that the continued success of the Port is highly dependent on competitive rail rates to serve its major markets of Montreal and Toronto. It is aware that continued erosion of rail traffic will lead to higher rates and the potential loss of container traffic to the Port of New York and U.S. West Coast Ports. The container traffic is considered very price sensitive and can easily be switched to competing ports although the Port is experiencing significant growth in container traffic at the present time. The loss of container traffic would put the viability of the Halifax-Moncton rail line in doubt. In addition, exporters in the region depend on the service provided by shipping companies at the Port of Halifax to deliver their goods to overseas markets. Some exporters would be obliged to give up export

markets if they had to bear the additional costs of shipping via the Port of Montreal or the Port of New York.

The Halifax Port Corporation is anxious to have CN Rail establish the intermodal terminal at the port in the area of Richmond Terminals. It will also help reduce truck traffic in downtown Halifax. The Port Corporation believes that double stack container service will eventually be put in place due to pressure on CN Rail from the shipping lines.

The shift in Newfoundland traffic from Sydney Harbour to Halifax was the prime topic of conversation by representatives of the Sydney Harbour Ports. They believe that the Truro-Sydney line will probably be abandoned in the not too distant future as a result. They are undertaking some initiatives to make Sydney Harbour a bulk transshipment centre (e.g., grain) but the impact on road and rail transportation is uncertain. The possibility of extending the Argentia ferry service to a year-round operation is also currently being examined. According to them, this may make Truro and Sydney possible locations for establishing intermodal (i.e., piggyback) terminals.

Terra Transport appears to be increasing its market share of the Newfoundland traffic at the expense of ACE. This is having positive impacts for the Port of Halifax and Atlantic Searoute Ltd. which have benefited from both an increase in traffic and the shift in container traffic from Sydney.

NOVA SCOTIA SHIPPERS

In order to obtain a more detailed and accurate profile of freight movements and the roles of the transportation modes in Nova Scotia, a shipper survey was carried out. The survey results also provided us with a greater appreciation of their needs, particularly in regard to the future use of the various modes as well as their opinions regarding current government policy. A detailed description of the survey methodology and survey results is presented in Appendix C.

Survey Methodology

The selection of the shipper sample was based on a number of factors including:

- use of the rail mode;
- representative cross-section of Nova Scotia industries;

EXHIBIT III-3

GROUPING OF RESPONDENTS TO SHIPPER SURVEY

BY INDUSTRY	NUMBER OF RESPONDENTS
Automobiles	3
Buiding materials	10
Grain	4
Liquid bulk	7
Pulp & paper	4
Resources	4
Retail/distribution	4
Steel/engineering	3
Total:	39

BY CN RAIL SUBDIVISION	
Bedford	11
Chester	3
Dartmouth	9
Hopewell	2
Oxford	4
Springhill	5
Sydney	5
Total:	39

- geographic location;
- shipper size (both large and small).

Shippers were selected from a universe which was developed from numerous sources including the Nova Scotia Directory of Manufacturers, the Atlantic Provinces Transportation Commission study,[4] the shipper list of the ADI Study and Peat Marwick's knowledge of Nova Scotia industry and shippers.

A questionnaire mailout followed by a telephone interview was the methodology employed in most cases to obtain the desired information. A copy of the questionnaire is included in Appendix C.

Sample Profile

Thirty-nine shippers responded to the questionnaire out of a total of 46 shippers who were contacted. The shippers were classified into eight industry groups and also by CN Rail's Nova Scotia subdivisions. The latter classification was made because the main focus of the survey was regarding shippers located on or close to CN's main lines. The breakdown of these classifications among the 39 respondents is presented in Exhibit III-3, **opposite**. A complete listing of the company names by industry group and CN Rail subdivision is presented in Appendix C.

Survey Results

A database was developed of the types of commodities being shipped, their mode of transport and the annual volumes. These data reflect current shipping patterns (i.e., 1989) in most cases. These data represent **carload** traffic only. Container traffic data to and from the Port of Halifax moving by rail is presented in Appendix B as supplied directly by CN Rail.

Exhibit III-4, **overleaf**, presents the annual volumes by industry grouping and by mode of transport. Three industry groups accounted for 85% of the volumes being shipped: resources, pulp and paper and liquid bulk. The resource industries (e.g., coal, gypsum and salt) are the main users of rail, making up close to 75% of the total rail volume.

---

[4] Atlantic Provinces Transportation Commission, **"Impact of Future Changes in Railway Services in the Maritime Provinces"**, May 1987.

EXHIBIT III-4

PEAT MARWICK SURVEY OF NOVA SCOTIA SHIPPERS (1989)

Tonnes

Annual Volumes - Inbound

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	70,481	11,843	0	12,000	94,324
Building Mat.	134,807	141,426	0	23,000	299,233
Grain	63,230	22,350	61,130	64,000	210,710
Liquid Bulk	65,455	22,545	0	938,000	1,026,000
Resources	0	2,200	0	0	2,200
Retail/Dist'n	90,795	6,193	0	58,500	155,489
Steel	124,130	16,536	0	0	140,665
Pulp & Paper	54,335	2,718,723	0	29,100	2,802,158
Total	603,232	2,941,816	61,130	1,124,600	4,730,778

Annual Volumes - Outbound

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	12,000	100,000	0	0	112,000
Building Mat.	124,979	493,193	0	300	618,472
Grain	9,000	217,074	0	0	226,074
Liquid Bulk	126,195	1,502,287	0	465,000	2,093,482
Resources	4,079,000	579,000	0	400,000	5,058,000
Retail/Dist'n	54,500	86,900	0	0	141,400
Steel	119,294	35,897	0	0	155,191
Pulp & Paper	354,826	84,661	0	434,465	873,952
Total	4,879,794	3,099,012	0	1,299,765	9,278,571

Annual Volumes - Total

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	82,481	111,843	0	12,000	206,324
Building Mat.	259,786	634,619	0	23,300	917,704
Grain	72,230	239,424	61,130	64,000	436,784
Liquid Bulk	191,650	1,524,832	0	1,403,000	3,119,482
Resources	4,079,000	581,200	0	400,000	5,060,200
Retail/Dist'n	145,295	93,093	0	58,500	296,889
Steel	243,424	52,433	0	0	295,856
Pulp & Paper	409,161	2,803,384	0	463,565	3,676,110
Total	5,483,027	6,040,828	61,130	2,424,365	14,009,349

Note: Rail volumes include carload traffic only.

EXHIBIT III-5

PEAT MARWICK SURVEY OF NOVA SCOTIA SHIPPERS (1989)

Tonnes

Annual Volumes - Inbound

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	74,795	78,248	0	87,000	240,044
Chester	77,188	696,919	0	11,500	785,607
Dartmouth	176,155	16,990	0	996,500	1,189,645
Hopewell	49,215	4,536	0	0	53,750
Oxford	48,735	1,014,273	0	0	1,063,008
Springhill	72,230	29,350	61,130	12,000	174,710
Sydney	104,915	1,101,500	0	17,600	1,224,015
Total	603,232	2,941,816	61,130	1,124,600	4,730,778

Annual Volumes - Outbound

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	3,137,255	437,800	0	0	3,575,055
Chester	55,979	206,354	0	143,565	405,898
Dartmouth	142,830	1,631,487	0	465,000	2,239,317
Hopewell	68,039	3,629	0	0	71,667
Oxford	109,760	61,000	0	565,200	735,960
Springhill	130,676	270,774	0	0	401,450
Sydney	1,235,256	487,968	0	126,000	1,849,224
Total	4,879,794	3,099,012	0	1,299,765	9,278,571

Annual Volumes - Total

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	3,212,050	516,048	0	87,000	3,815,099
Chester	133,167	903,273	0	155,065	1,191,504
Dartmouth	318,985	1,648,477	0	1,461,500	3,428,962
Hopewell	117,253	8,165	0	0	125,418
Oxford	158,495	1,075,273	0	565,200	1,798,968
Springhill	202,906	300,124	61,130	12,000	576,160
Sydney	1,340,171	1,589,468	0	143,600	3,073,239
Total	5,483,027	6,040,828	61,130	2,424,365	14,009,349

Note: Rail volumes include carload traffic only.

Exhibit III-5, **opposite**, presents the annual volumes by CN Rail subdivision. The Bedford, Sydney and Dartmouth subdivisions account for most of the rail freight movements in Nova Scotia. Most of the Bedford traffic is accounted for by a large gypsum move by rail from Milford to the Port of Halifax (Dartmouth Subdivision) for export by water. The balance of the traffic represents primarily truck movements from central supply locations in the Halifax area to customers located around Nova Scotia. Aside from inbound and outbound marine shipments attributed to the Dartmouth subdivision, the large majority of Dartmouth shipments represent outbound truck shipments of liquid bulk products to customers located across Nova Scotia. On the Sydney subdivision, the majority of outbound traffic is by rail (resource and pulp and paper industries) while 90% of inbound traffic is by truck spread over all industry groupings.

In comparison with CN Rail's actual volumes of carload traffic originating and terminating on each subdivision, it was found that the shipper survey captured most or all of CN Rail's traffic.

The detailed survey results are presented in Appendix C by each individual question. Some of the highlights are as follows:

- Transportation problems relate mainly to slow rail service, rail car shortages or produce damage/loss while in transit;
- Reasons for mode selection are cost and special handling characteristics in the case of rail and cost, speed and availability in the case of truck;
- The importance of rail was indicated as follows by number of respondents:

- indispensable	—	18
- highly important	—	8
- important	—	9
- some importance	—	2
- not important	—	2
Total:		39

- Future changes in modal use were varied, although a shift from rail to truck was the most predominant;
- The future use of rail was expected to remain fairly stable;
- In regard to government policies and initiatives, improved highway quality and four-laning of the Trans-Canada highway were the preoccupation of shippers.

Comments

The results of the survey point to a mature transportation market with insignificant shifts in modal selection expected into the near future. While 67% of shippers rate rail as highly important or indispensable, rail volumes (carload) will not increase in the future. Thus, from the standpoint of shippers, while the future of rail does not look especially promising, its loss would be very strongly felt.

SUMMARY AND CONCLUSIONS

The examination of the present Nova Scotia freight traffic profile revealed a number of important findings as follows:

- The improvement in CN Rail's share of the Nova Scotia transportation market over the past two years due primarily to growing intermodal (i.e., container, piggyback) volumes;
- CN Rail intermodal traffic is on an equal footing with its carload traffic for movements to and from the Province;
- The dominance of the truck mode in Nova Scotia if the overhead import/export container traffic is excluded and if one considers that the rail piggyback traffic is actually moved by truck over Nova Scotia roads to/from CN Rail's intermodal terminal at Moncton, New Brunswick;
- The concentration of CN Rail's carload traffic in a few high volume movements of resource products (e.g., gypsum, coal)
- The relatively insignificant impact that the Free Trade Agreement is expected to have on Nova Scotia's traffic patterns;
- The possibilities for greater cooperation between the rail and truck modes;
- The contrasting opinions of the rail and truck modes in regard to the impact of increased truck weights and dimensions in the transportation marketplace;
- The picture of a mature transportation marketplace with only insignificant shifts of modal selection expected;
- The indispensable nature of rail service for those shippers who continue to use rail.

The future viability of the Truro-Sydney rail line is very much in jeopardy based on the results of our research. The definite loss by 1991 of the 300,000 tonnes/annum of Devco coal from Victoria Junction to Trenton and the probable loss within five years of the 454,000

tonnes/annum of gypsum from the River Denys quarry to Point Tupper are the principal reasons. The shift in container volumes from the North Sydney - Port-aux-Basques route to the Halifax-St.John's route due to the abandonment of the Newfoundland Railway is also a negative factor. Finally, the VIA Rail passenger train service operating between Truro and Sydney will be discontinued in January 1990 due to reductions in VIA Rail's budget announced by the Federal Government.

The Halifax-Moncton rail line, on the other hand, has recently experienced increases in traffic volumes due principally to increased import/export container traffic through the Port of Halifax and the additional Newfoundland container traffic volume mentioned earlier.

The future financial viability of this rail line, however, is highly dependent on the import/export container traffic. Although Halifax Port Corporation officials remain optimistic for further growth in container traffic volumes, there are global events taking place which might put the competitive position of the Port of Halifax into some jeopardy for the handling of container traffic in the longer term. Two of the more significant developments are:

1. **Double-stack container trains via west coast ports**—Traffic between the Far East and North American markets is being transported more and more by the services of double-stack container trains via west coast ports (primarily U.S. ports such as Seattle). Container lines (e.g., Maersk and NYK Line) have announced double-stack services into Central Canada. Thus, the possibility exists that the **Far East services may eventually cease to call at the Port of Halifax** and serve their eastern Canadian markets via the west coast.

2. **The Port of New York as a load centre**—Although the concept of load centres (i.e., the use of a few major ports to serve, for example, the North American market) is not new, the inauguration by Conrail of direct rail service this summer between New York and Montreal again raises the possibility that **New York may eventually become the major east coast port to serve the eastern Canadian market**. This would be to the detriment of both the ports of Montreal and Halifax.

At present traffic levels, the Halifax-Moncton rail line appears to be financially viable. However, the long-term uncertainty of the import /export container traffic places in doubt the financial viability of the line in the 21st century. The Halifax Port Corporation which is well aware of these potential threats, will be taking every initiative to counteract them and to maintain its share of the market.

EXHIBIT III-6

PROTOTYPE MOVEMENTS

Company	City	Subdivision	Product	Annual Volume (tonnes)	Origin	Destination	Possible Diversion
1) Michelin Tires	Granton Bridgewater	Oxford Chester	Tires	20,000	Granton Bridgewater	Numerous (North America)	From truck to piggyback
2) St.Lawrence Cement	Bedford	Bedford	Cement	45,000	Québec City	Bedford	From rail to marine
3) Canexel	East River	Chester	Hardboard	11,000	East River	Numerous (North America)	From rail to truck (piggyback via Saint John)
4) Canwell	Dartmouth	Dartmouth	Lumber products	unknown	PQ/Ontario	Dartmouth	From rail to truck
5) Daigle Lumber	Dartmouth	Dartmouth	Roofing shingles	2,200	Ontario	Dartmouth	From rail to truck
6) Dover Mills	Halifax	Bedford	Wheat/flour	2,700	Ontario	Halifax	From rail to truck (local wheat)
7) Canada Packers	Truro Port Williams	Springhill DAR	Grain	11,200	Ontario	Truro Port Williams	From rail to marine
8) W.A. Flemming	Truro	Springhill	Grain	17,000	West/Ontario	Truro	From marine to rail
9) Imperial Oil	Dartmouth	Dartmouth	Catalyst/petroleum products	5,000	PQ/Ontario	Dartmouth	From rail to marine
10) Scott Maritimes	Abercrombie	Oxford	Sodium Chlorate	4,040	Montreal	Abercrombie	From rail to truck
11) Scott Maritimes	Abercrombie	Oxford	Bleached Pulp	18,150	Abercrombie	Wisconsin	From rail to marine
12) Stora Forest Industries	Port Hawkesbury	Sydney	Wood Pulp	15,000	Port Hawkesbury	PQ/Ontario	From rail to truck
13) Canadian Salt Co.	Pugwash	Oxford	Salt	55,000	Pugwash	NB/PQ	From rail to marine or truck
14) Robb Engineering	Amherst	Springhill	Steel Plate	13,000	PQ/Ontario	Amherst	From rail to truck
15) Devco	Sydney	Sydney	Coal	250,000	Sydney	Point Tupper	From rail to truck
16) Georgia Pacific	Port Hawkesbury	Sydney	Gypsum	454,000	River Denys	Point Tupper	From rail to truck

Based on the results of our shipper survey and our transportation experience, a listing of possible prototype movements is presented in Exhibit III-6, **opposite**. These prototype movements constitute a reasonably complete list of significant traffic movements which could conceivably be directed from or to the rail mode.

The total volume of traffic involved is 923,000 tonnes, although the net diversion from rail is 849,000 tonnes. The largest movement — the 454,000 tonnes of gypsum from River Denys to Point Tupper may simply disappear within the next few years. Secondly, it should be pointed out that this is a **long list** of prototype movements. The net diversion of traffic from the rail mode to competing modes seems more likely to be in the 35,000-tonne range and will be in our diversion analysis. Thus, the question of future traffic diversion from rail to road is not significant and is only one of a number of factors which may determine the future viability of the remaining rail lines in Nova Scotia.

IV. ROAD USER CHARGES AND EXPENDITURES

This chapter examines the road user charges (i.e., revenues) and expenditures associated with provincial and municipal roads that are used by licensed motor vehicles. The analysis compares revenues with expenditures for the following provinces:

- Nova Scotia
- New Brunswick
- Quebec
- Ontario
- Manitoba

For Nova Scotia, four benchmark years were selected to indicate trends in the various revenue and expenditure categories. These were the selected fiscal years:

- 1974/75
- 1978/79
- 1982/83
- 1986/87

For the other provinces only 1986/87 was studied. The purpose of analyzing provinces other than Nova Scotia was to compare Nova Scotia's position vis-a-vis other jurisdictions in Canada. It was felt that the example of four other provinces will adequately serve that purpose. The selected provinces were considered to be the most representative in Canada. British Columbia was excluded because of its difficult terrains and high road construction costs. Alberta and Saskatchewan were excluded because they do not collect fuel taxes. Newfoundland and P.E.I. were considered to be too small in scale in comparison to the other provinces.

In the following sections, we describe:

- the scope of the analysis;
- the general methodology applied;
- the revenue categories;
- the expense categories; and,
- a comparison of revenues with expenses.

Background details of the analysis are provided in Appendix E.

SCOPE OF THE ANALYSIS

The following **provincial** capital and operating expenses were included in the analysis:

- direct capital and operating expenses for provincial highways, including the TransCanada Highway;
- expenses on bridges and causeways;
- administrative, planning, and engineering expenses attributable to highway transportation, as reported in Transportation Department annual reports and/or Statistics Canada publications;
- a portion of police and court expenses attributable to highway transportation.

Expenditures for ferries were excluded from the analysis because the use of ferries as part of the road transportation system varies from province to province.

The following **provincial** revenues were included in the study:

- gasoline and other transportation fuel tax revenues;
- vehicle registration and driver licence revenues;
- tolls;
- fines related to highway transportation and moving offences;
- payments received from the Federal Government in aid of transportation, or from industry under cost-sharing agreements.

The latter revenue source, although not directly collected by the province and provided more on an ad hoc basis, helps finance provincial road construction projects involving the Federal Government or private industry. Examples include the construction of the Trans-Canada Highway and access roads for federal facilities (e.g., airports) or private industry (e.g., new plants or mines).

When matching the revenues above with the expenses above, it should be noted that a substantial portion of the fuel used for transportation and a considerable portion of the time of vehicles equipped with licence plates (including their drivers' time) is related to vehicle

movements on municipal roads. The latter include not only urban streets but substantial networks of intercity highways, practically indistinguishable in function from some provincial highways. Consequently, to provide a fair comparison of provinces, municipal expenditures on roads had to be included in the analysis. The **municipal (local)** expenditures considered were direct capital and operating expenses on roads, excluding those non-transportation related expenses that could be clearly identified from public data (e.g., street lighting, street signs, transit-related expenses).

No municipal revenues were considered as earmarked for transportation. All such revenues were considered to be collected by the provinces. However, transfer payments are made by the provinces to the municipalities, in recognition of the use of municipal roads by the vehicles that generate provincial revenues while using them. The percentage of municipal expenditures covered by these transfer payments varies from province to province and is shown later in this chapter.

The purpose of local roads, particularly of urban streets, is not solely the provision of facilities for vehicles. Even if no vehicles moved on the roads, people would still need properly maintained **access** to their homes, which would cost substantial amounts. Examples are special streets in some cities that are closed to vehicular transportation for historic or other reasons. Obviously, the construction and maintenance of such streets do cost substantial amounts, even if those amounts might be smaller than the costs associated with busy roads that are worn out by traffic and must be wider than streets used only by pedestrians.

This study does not attempt to estimate the "proper" balance between the different functions of local roads. Generally, the access function is far more predominant within cities than outside cities. Consequently, a significantly larger portion of municipal road expenditures should be considered as being related to vehicular transportation in those provinces in which a larger portion of the intercity highway network belongs to the municipalities (such as Ontario) than in provinces in which municipal roads are more confined to urban areas (such as Nova Scotia or New Brunswick).

The municipal operating expenses shown in the report are somewhat understated, as it was not possible to allocate any administrative expenses to transportation.

In the definition of "road revenues" the issue of transportation fuel taxes requires some comments. This report considers fuel taxes to be legitimate user charges, collected by the provinces for the purpose of defraying some of the road expenditures. Since there is a direct linkage between the usage of roads and the consumption of fuel, the analysis in this report is based on the principle that transportation fuel taxes are genuine user charges. The reason for this contention is that all other transportation infrastructures provided by Government have means of collecting fees on the basis of usage (such as airport landing fees, port charges, ferry tolls). If it were not for the fuel tax, there would be no similar fee paid by road users. The only remaining issue is whether the amount of fuel tax properly attributable to road users should be reduced by an "implied sales tax" in those provinces in which a general sales tax is levied on most goods and services but not on transportation fuels. As provincial policies differ on that subject, and since there is a range of other goods and services that are exempt from provincial sales taxes in most jurisdictions, this study considered all provincial fuel tax revenues derived from the sale of transportation fuels as contributing to the recovery of road costs (i.e., no adjustment for sales tax practices).

Completely excluded from this analysis are the revenues generated by the federal sales tax and the federal excise tax on fuel. They are not considered to be road user charges. Road expenditures are not the responsibility of the Federal Government and there is no evidence to suggest that the federal fuel taxes have any relation in this regard. This is not to say that there is not some debate on the subject. Various lobby groups including trucking associations contend that a significant share of federal revenues generated by fuel taxes should be returned to improve the road network or otherwise reduced to reflect the financial payments that the Federal Government now contributes to road improvements.

METHODOLOGY

Much of the methodology applied to the analysis has already been described in the preceding section. These are a few additional comments on the subject.

In selecting **data sources**, the following **priority** was adopted:

1) Where possible, Provincial Department of Transportation Annual Reports were used.

2) Public Accounts were used for data not available from the previous sources. Police and court revenues and expenses were generally in that category. Public Accounts were also used in some cases in which it was ascertained that their data were essentially identical to those published in Department of Transportation reports.

3) As a third priority, Statistics Canada data were used when the required disaggregation of information was not available from the preceding sources.

In addition to published data, certain **allocations** had to be made by the study team, based on estimates. Examples of such estimates were:

- the split between capital and operating expenses for some of the expense categories;
- the allocation of police and court revenues and expenses to transportation.

These estimates were based on a previous, confidential study carried out by Peat Marwick on the subject of comparative transportation subsidies. In that study, personal interviews were held with various government officials to develop an "informed estimate" for those allocations, assisted by unpublished data available to these officials.

A more detailed description of the allocations is provided in Appendix E.

Provincial/Municipal Transfer Payments

Net transfer payments flowing from the provinces to municipalities are presented in this report as "local expenditures funded by Province". This form of presentation enables the reader to assess the balance of provincial revenues against total cash outflows, clearly indicating the net surpluses or deficits experienced in provincial financial flows.

The remaining municipal expenditures ("local expenditures funded by municipality") are shown for the sake of completeness but no municipal revenues are shown to offset those. Municipal expenses are funded through municipal taxes and borrowings.

Accounting Method

The cash method of accounting was used in the analysis. That method conforms with generally applied government accounting principles as opposed to the accrual method of accounting used in business.

The cash method of accounting ignores the values created by capital expenditures, which would be accumulated as assets on corporate balance sheets.

If there was no inflation and no system growth, the two methods would not differ from each other materially in the long run. In practice, depending on the relations between inflation and interest rates and the rates of system growth, one or the other method may produce higher numbers for total expenses.

Two methods are compared in this chapter on the basis of a study conducted by Transport Canada in 1982, entitled "Transport Costs and Revenues in Canada, 1969-1979". The main differences between the two methods are:

- In the **accrual** method of accounting, capital costs are charged against revenues in the form of depreciation over the service life of the asset. The undepreciated value of the asset, not having been charged against revenue, requires funding from the outside (through loans or investors' equity). That funding raises the requirement for paying interest and/or dividends. Generally, a provincial government would have little or no equity in its road system and, therefore, the cost of carrying the assets is entirely represented by the payment of interest on provincial bonds.

- In the **cash** method of accounting, capital costs are charged against revenues in the year that they occur. This method overstates expenses in the year in which the investment occurs because the cash outflow for capital investments is always substantially greater than the depreciation of existing assets due to inflation and system growth (in a world without inflation and growth, the replacement of worn out assets would generally incur the same capital expense as depreciation). The cash method of accounting does not include any interest in the expenses (since the asset is written off in the form of a one-time expense on the day it is acquired) and, therefore, understates the expenditures in subsequent years.

It can thus be concluded that the cash method of accounting overstates expenditures in relation to the accrual method of accounting in the years in which significant capital investment occurs and understates them in years of low capital investment. The balance may move either way but, as shown later in this chapter, in recent times, the accrual method of accounting has generally resulted in higher expenses than the cash method. However, at times of rapid expansion the cash method would result in higher expenses.

Disaggregation of Revenues and Expenses

When different transportation modes are compared, it is necessary to avoid the comparison of "apples and oranges". Thus, when goods transportation by rail and truck is compared, a valid comparison should exclude:

- passenger transport;
- goods transport in small trucks and vans;
- local transportation within municipalities or metropolitan areas.

There are many conceptual and data difficulties associated with such disaggregation of transportation revenues and expenses. Little information is available on the proportions of transportation fuel consumed in local vs. intercity transportation. Registration and licence fees are common to both types of transportation and can only be allocated in some arbitrary manner. The allocation of highway costs to passenger automobiles, small trucks and large trucks has been the subject of substantial controversy regarding allocation principles.

Peat Marwick has addressed these issues in the confidential study mentioned earlier. In that study, an Ontario Ministry of Energy survey was used to estimate the division between local and intercity fuel consumption. Registration and licence fees were arbitrarily divided between the two sectors in the same proportion as fuel. For the allocation of road expenditures between small and large vehicles, the **incremental** principle was applied. Accordingly, through sample engineering studies, the capital and maintenance costs of a highway designed exclusively for passenger automobiles and small vans was first determined. The difference (i.e., incremental costs) between the actual expenses and these costs was then allocated to trucks. That analysis was applied to the provinces of Ontario and Quebec.

It was not within the scope of this study to perform such disaggregations for Nova Scotia in a detailed manner. Instead, this chapter presents broad estimates of the disaggregations, using some of the findings of the previous study.

Exhibit IV-1

NOVA SCOTIA

Road Revenues and Expenditures

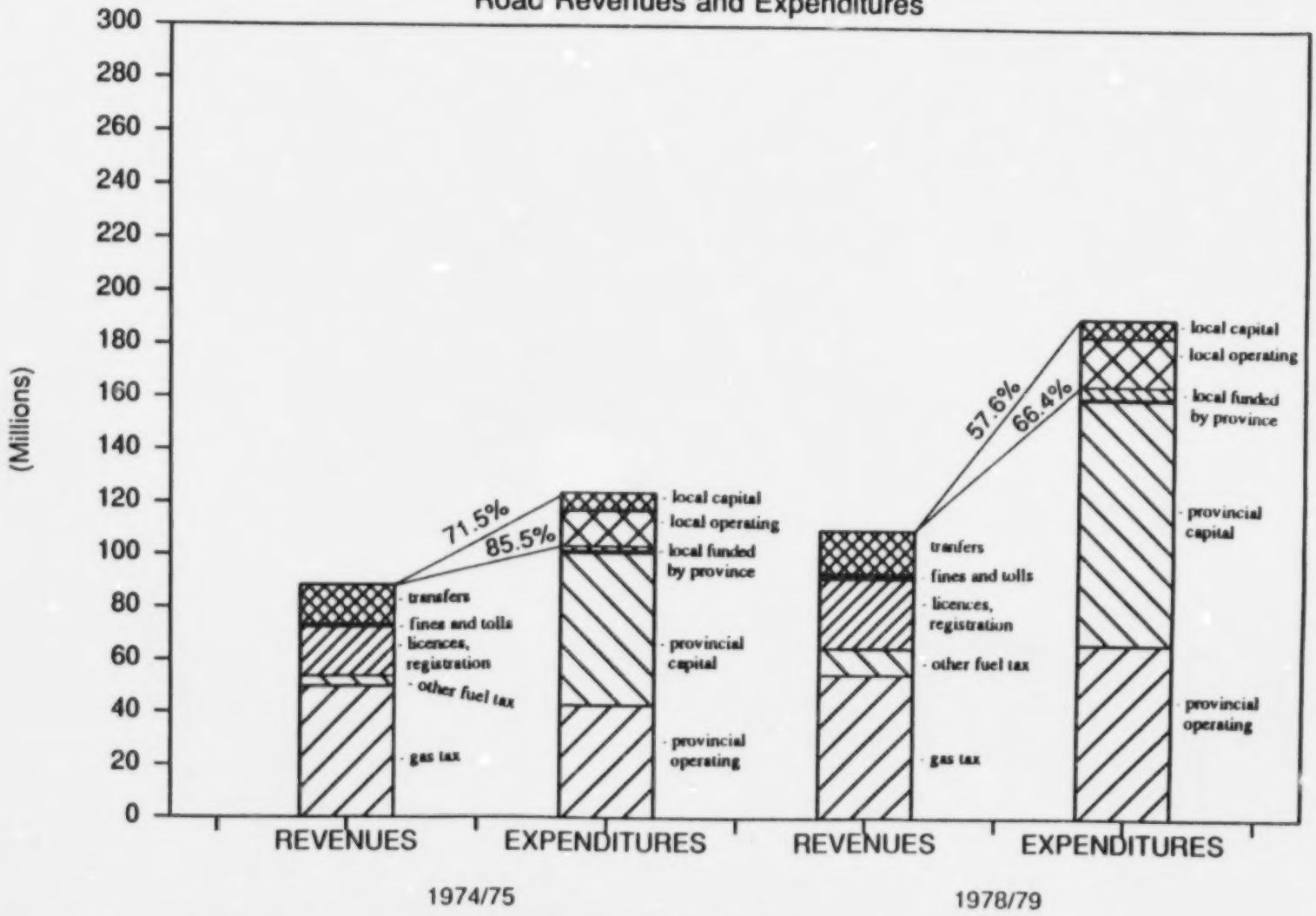
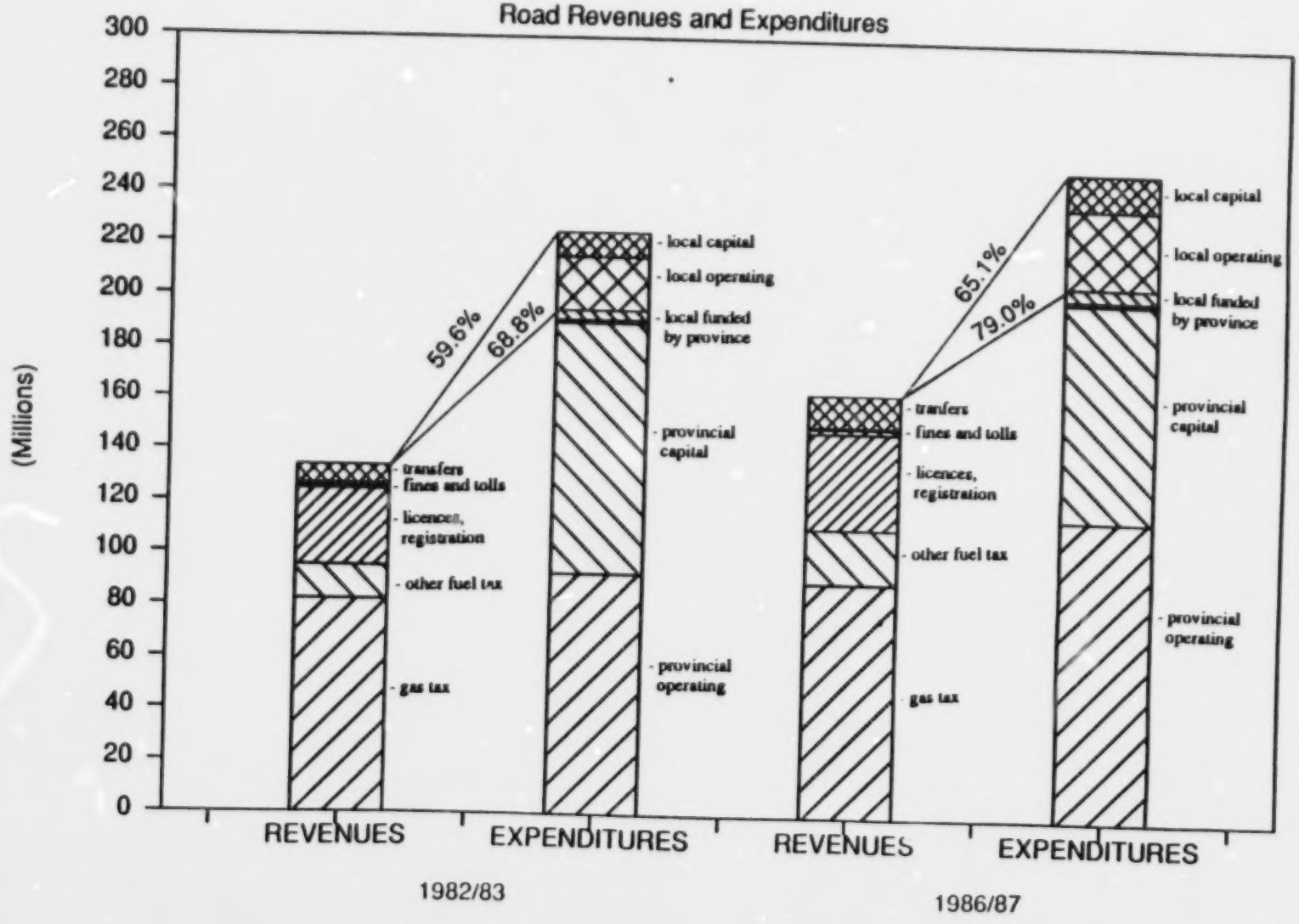


Exhibit IV-1 (cont'd.)

NOVA SCOTIA



Presentation of Results

The next section presents the results in graphical and numerical form. The detailed background data to the presentation are provided in Appendix E. The section also provides the broadly estimated disaggregations indicated above. The next section of the chapter provides a brief comparison of transportation fuel taxes and registration/licence fees that are currently in force in Canada's ten provinces. That section indicates Nova Scotia's relative position vis-à-vis other jurisdictions. The last section of the chapter examines future road user charges.

RESULTS

Exhibit IV-1, **opposite**, presents a summary of road-related revenues and expenses for the Province of Nova Scotia for the four benchmark years selected for examination. Exhibits IV-2 and IV-3, **overleaf**, present similar results for the fiscal year 1986/87 for the other four provinces (i.e., New Brunswick, Quebec, Ontario and Manitoba) for comparative purposes. The two cost recovery percentages indicated on the exhibits refer to the percentage that provincial revenues cover of: 1) provincial expenditures; and, 2) provincial **plus** municipal expenditures.

The following conclusions can be drawn from the results:

- The largest portion of road-related revenues is generated from transportation fuel taxes.
- Revenues generated from registrations and licenses are smaller than the revenues generated by transportation fuel taxes and revenues generated from fines are very small in relation to total revenues.
- Revenues derived from transfer payments are relatively more significant in New Brunswick and in Nova Scotia than in the other provinces. In Manitoba, Ontario and Quebec, transfer payments represent a very small percentage of total revenues. Most of the transfer payments are made by the Federal Government (80-100 percent of all transfers), while revenues derived from industrial joint projects represent relatively small amounts.
- Most of the total road-related expenditures are funded by the provinces. Municipalities fund some of the total road-related expenditures in each province, that proportion being the lowest in Nova Scotia and the highest in Manitoba.

The background data to these exhibits are provided in Appendix E.

Exhibit IV-2

NEW BRUNSWICK & MANITOBA

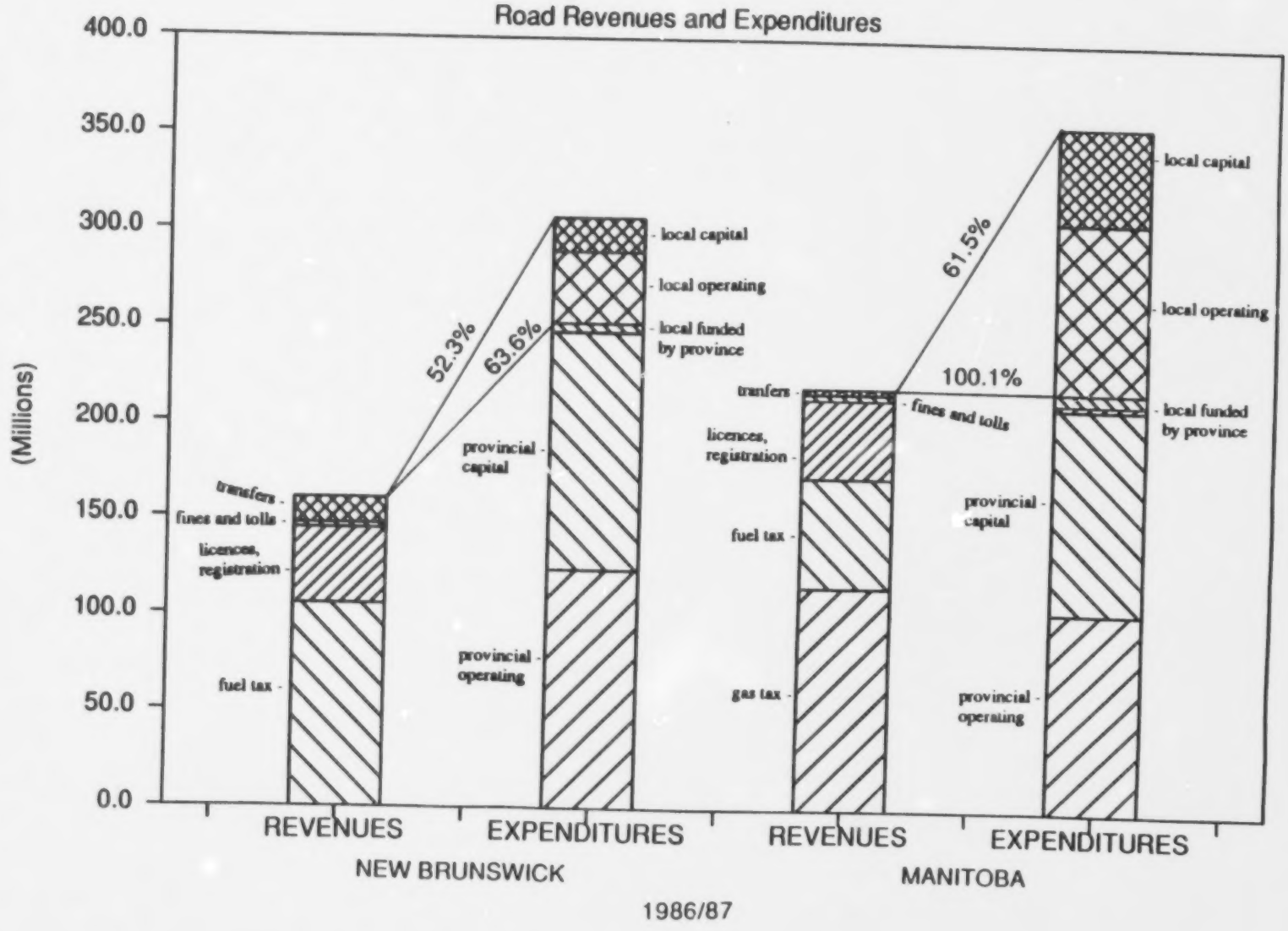
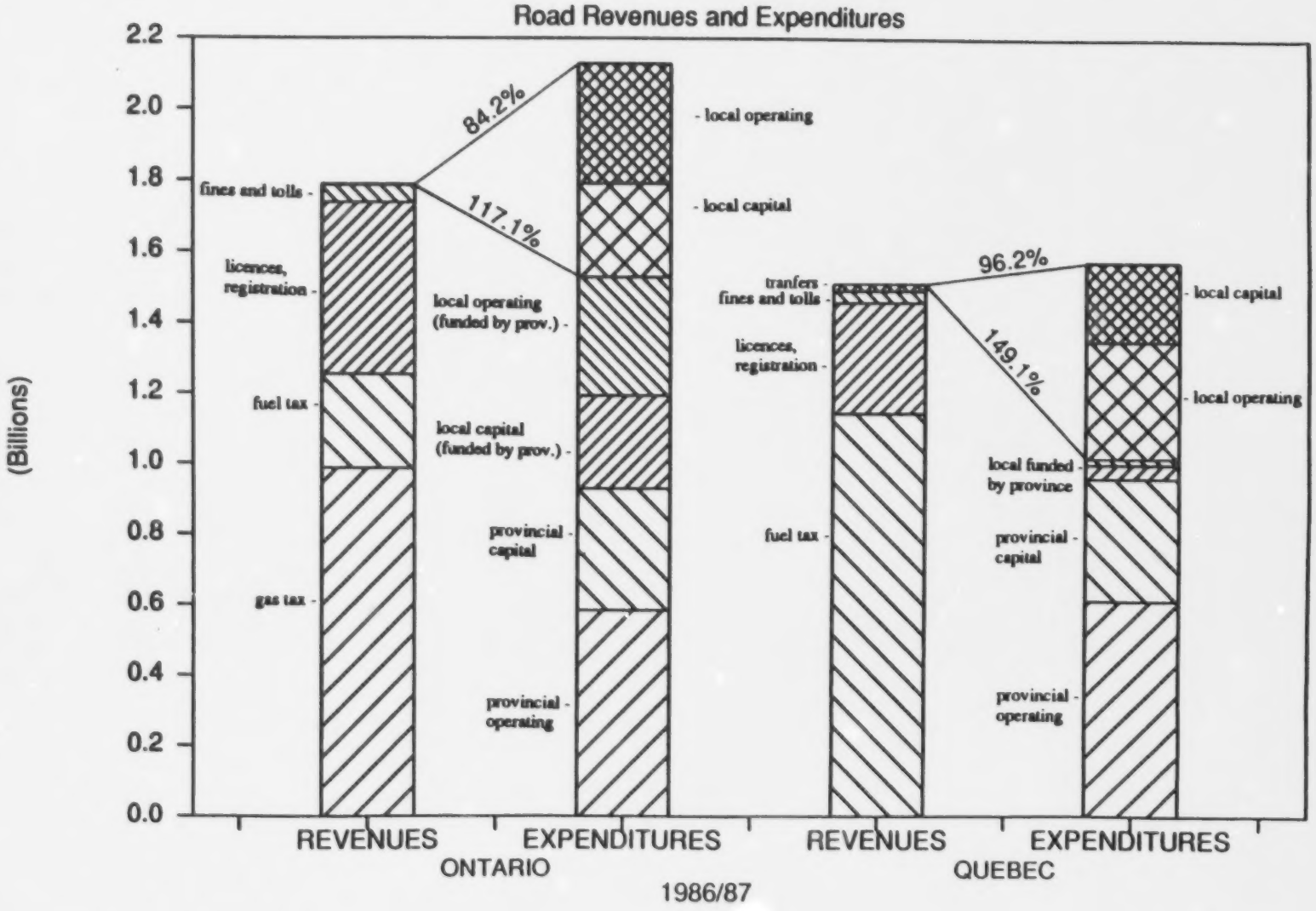


Exhibit IV-3

ONTARIO & QUEBEC



Federal Government Transfer Payments

The following table summarizes the percentage of total revenues received in the form of transfer payments from the Federal Government in each province. It shows that, for Nova Scotia, that percentage has decreased in more recent years. In comparison with other provinces, the Federal Government transfer payments as a percentage of total revenues is less for Nova Scotia than New Brunswick but greater than the percentages for Manitoba, Ontario and Québec.[1]

Province	Federal Transfer Payments	
	$ (million)	Percent of All Revenues
Nova Scotia		
1974/75	9.8	11.1%
1978/79	15.4	14.0%
1982/83	7.0	5.2%
1986/87	10.4	6.4%
5-year Average (1983/84-1987/88)	11.8	7.1%
New Brunswick		
1986/87	13.2	8.2%
5-year Average (1983/84-1987/88)	27.3	17.5%
Manitoba		
1986/87	2.4	1.4%
5-year Average (1983/84-1987/88)	1.8	1.1%
Ontario		
1986/87	2.6	0.2%
5-year Average (1983/84-1987/88)	1.6	0.1%
Quebec		
1986/87	5.5	0.4%
5-year Average (1983/84-1987/88)	11.3	0.8%

[1] It should be noted that the amounts indicated in Appendix E for "Transfers from Other Sources" include amounts received from all sources (i.e., not just the Federal Government) including some non-transportation-related sources and thus, slight differences exist between Appendix E and the figures presented above.

Municipal Versus Provincial Expenditures

The next table shows the percentage of total road-related expenditures funded by the provinces vs. those funded by the municipalities. Transfer payments from the provinces to the municipalities are considered as provincial expenditures in the table.

Province	Percent of Provincial Expenditures	Percent of Municipal Expenditures
Nova Scotia		
1974/75	83.6%	16.4%
1978/79	86.6%	13.4%
1982/83	86.6%	13.4%
1986/87	82.5%	17.5%
New Brunswick		
1986/87	82.2%	17.8%
Manitoba		
1986/87	61.4%	38.6%
Ontario		
1986/87	71.9%	28.1%
Quebec		
1986/87	64.5%	35.5%

Exhibits IV-1 to IV-3 indicate that only Ontario provides a substantial contribution to municipal expenditures that is large in relation to all municipal expenditures. Ontario reimburses the municipalities for one half of their capital and operating expenditures . The other provinces provide relatively smaller contributions.

Provincial Revenues Versus Expenditures

The balance of road-related revenues and expenditures differs significantly from province to province. The table below shows the percentage of **provincial** expenditures recovered from road-related revenues.

Province	Provincial Road-Related Expenditures $ (million)	Percentage of Provincial Road-Related Expenditures Recovered from Revenues	Shortfall (Surplus) $ (million)
Nova Scotia			
1974/75	103.4	85.5%	15.0
1978/79	165.3	66.4%	55.4
1982/83	195.0	68.8%	60.8
1986/87	206.9	79.0%	43.4
New Brunswick			
1986/87	252.3	63.6%	91.8
Manitoba			
1986/87	219.4	100.1%	0.0
Ontario			
1986/87	1,528.7	117.0%	(260.0)
Quebec			
1986/87	1,014.2	149.1%	(498.0)

The table above indicates that the Province of Nova Scotia was close to breaking even in 1974/75 when it recovered 85.5 percent of its road-related expenditures. The recovery rate deteriorated to 1978/79 but eventually almost returned to its earlier level; in 1986/87 the Province recovered 79.0 percent of its road-related expenses.

Exhibits IV-2 and IV-3 indicate that New Brunswick is performing less satisfactorily than Nova Scotia. However, Manitoba broke even almost exactly in 1986/87 while the Provinces of Ontario and Quebec collected revenues far in excess of their road-related expenditures.

The balance of revenues and expenditures is different when municipal expenditures are added. The table below shows that considering the total amounts of provincial plus municipal road-related expenditures within the boundaries of each province, none of the provinces recovered its total expenditures.

Province	Total Road-Related Expenditures (Provincial and Municipal) $ (million)	Road-Related Revenues as Percentage of Total Expenditures (Provincial and Municipal)	Shortfall (Surplus) $ (million)
Nova Scotia			
1974/75	123.6	71.5%	35.2
1978/79	190.8	57.6%	80.9
1982/83	225.1	59.6%	90.0
1986/87	250.9	65.1%	87.5
New Brunswick			
1986/87	307.0	52.3%	146.4
Manitoba			
1986/87	357.2	61.5%	137.5
Ontario			
1986/87	2,125.7	84.2%	335.9
Quebec			
1986/87	1,571.6	96.2%	59.7

The pattern is similar to the pattern of strictly provincial revenues and expenditures. In 1974/75 Nova Scotia recovered 71.5% of all the provincial plus municipal road-related expenditures within the province's boundaries in the form of user charges. That percentage declined thereafter but started to increase again and almost reached its earlier level in 1986/87. New Brunswick recovers substantially less of its total road-related expenditures within the province's boundary than Nova Scotia while Manitoba recovers a percentage that is close to Nova Scotia's. Ontario recovers a much higher percentage while Quebec recovers almost all of its road-related expenditures within the province's boundaries.

As illustrated in the previous table, it is obvious that road transportation is subsidized to a substantial extent in Nova Scotia. It is subsidized to an even greater extent in New Brunswick, to approximately the same extent in Manitoba, to a lesser extent in Ontario and practically not at all in Quebec. In Nova Scotia, the cross-subsidy received by road transportation in 1986/87 from provincial and municipal sources amounted to $87.5 million. Approximately one half of that amount came from provincial sources, the remainder from municipal sources.

The Impacts of Accrual Accounting

As explained in the previous section, in recent years, the cash method of accounting has generally understated the levels of expenses by ignoring the interest expenses attributable to the undepreciated value of the road networks. Based on the Transport Canada study cited in the preceding section, the following table indicates the increase in total expenses that would have resulted from the use of accrual accounting in 1979 vs. the use of the cash method of accounting. The corresponding multipliers are likely to be similar today.

Province	Ratio of Total Expenses Computed by Accrual over Cash Method	Re-Stated Shortfall of Revenues from Total Expenditures (Provincial and Municipal) $ (million)	Percent
Nova Scotia			
1974/75	1.06	42.7	32.6%
1978/79	1.09	98.0	47.2%
1982/83	1.16	129.2	49.1%
1986/87	1.16	130.1	44.3%
New Brunswick			
1986/87	1.17	198.7	55.3%
Manitoba			
1986/87	1.10	173.3	44.1%
Ontario			
1986/87	1.26	888.8	33.2%
Quebec			
1986/87	1.23	468.1	23.6%

The shortfalls are clearly more significant under the accrual method of accounting than under the cash method of accounting.

Road Costs and User Charges

Considerable research and policy development (particularly in the United States) has been devoted to the subject of highway finance. Debate has become more intense in recent years as governments face increasing demands to rehabilitate and upgrade the road network in an era of

fiscal restraint. In spite of the extensive research conducted to date, [2] there still exists a great deal of controversy and divergence of opinion over a number of issues.

A literature review recently carried out by the U.N.B. Transportation Group[3] found that there is general consensus concerning economic principles (e.g., the use of marginal cost pricing) but considerable debate remains over their application. The principal areas of debate concern:

- **cost measurement** (i.e., the definition and measurement of costs to be recovered from users);
- **cost allocation** which includes the assignment of highway costs between user and non-user groups (e.g., property owners, local residents) and the methods used for measuring the costs among different classes of users;
- **the development of appropriate and equitable user charges** among the various road users.

Research both in Canada and the U.S. indicates that the revenues generated by traditional user charges (e.g., vehicle registration fees, fuel taxes) do not adequately reflect the highway costs that the various classes of highway users are responsible for. In effect, automobiles and lighter vehicles subsidize heavier vehicles whose user charges do not generate sufficient revenues to cover the highway costs that they cause. As a result, a number of U.S. states[4] have developed policies and implemented innovative user charges which more adequately reflect cost causality. The most common are third-tier or third structure user charges[5] which levy weight-distance taxes (in various forms) on heavy vehicles which partially or completely replace the diesel fuel tax. These policies have been implemented in spite of the continuing controversies on this subject.

In Canada, the provinces have not yet developed comprehensive road finance policies and instead rely upon traditional road user charges. Apart from the complexities of determining equitable road user charges for the various classes of users, administrative and enforcement concerns have been raised. There has also been a lack of in-depth Canadian research on the subject. Canadian research has tended to rely on available Canadian statistics supplemented by

---

[2] See Appendix I for a bibliography of a number of reports and articles written in regard to highway finance.
[3] The University of New Brunswick Transportation Group, **"Highway Finance — A Literature Review"**, Prepared for: The Canadian Trucking Association, May 1989.
[4] The State of Oregon is a pioneer in the area of cost allocation and implementation of third structure taxation.
[5] Vehicle registration fees are considered first-tier user charges and fuel taxes are considered second-tier user charges.

EXHIBIT IV-4

TRANSPORTATION FUEL TAXES[1]

(August 1, 1989)

	Diesel (%)	Gasoline (%)
Newfoundland	27.0	23.0
Nova Scotia	21.0	20.0
P.E.I.	23.0	20.0
New Brunswick	31.5	24.5
Québec[2]	31.0	31.0
Ontario[2]	27.3	22.4
Manitoba[2]	24.8	17.4
Saskatchewan[2]	25.0	21.7
Alberta[2]	12.5	11.0
British Columbia	23.6	22.5

Note: Percentages are markups on pre-tax prices.

---

1 Source: Energy, Mines and Resources Canada **Petroleum Product Market Report**; August 1989.
2 Based on 40¢/litre basic diesel price and 46¢/litre basic gasoline price (regular/unleaded).

isolated Canadian engineering studies and the U.S. research. The research which has been conducted tends to confirm the U.S. findings regarding heavier vehicles.

COMPARISON OF 1989 USER CHARGES

Exhibit IV-4, **opposite**, shows the fuel taxes in each of Canada's provinces as of August 1, 1989. All taxes are expressed in terms of percentages, applied to the pre-tax retail price of diesel fuel and gasoline. A uniform pre-tax price of 40¢ per litre was assumed for diesel fuel and a uniform pre-tax price of 46¢ per litre was assumed for regular, unleaded gasoline throughout Canada. That definition of the price is important in those provinces in which the fuel tax is expressed in ¢/litre rather than in percentage terms.

Nova Scotia is approximately in the middle of the range among provinces for both diesel and gasoline. Quebec and British Columbia are at the top, charging approximately 50 percent more in taxes than Nova Scotia.

For information purposes, the federal sales and excise taxes on diesel fuel at the wholesale level (i.e., prior to application of the provincial fuel tax) were 2.7¢/litre and 4.0¢/litre respectively.

Registration/Licence Fees

Exhibit IV-5, **overleaf**, shows typical registration fees for two truck sizes as of August 1, 1989. Nova Scotia is close to the lower end of the ranges, with only P.E.I. charging less for a licence plates in both size categories. In the smaller category, Newfoundland and British Columbia charge approximately the same amount as Nova Scotia, but in the larger category, both provinces charge significantly more.

Quebec, Manitoba and Saskatchewan represent the high ends of the scales. Quebec charges 32 to 40 percent more than Nova Scotia, while Manitoba and Saskatchewan charge some 70 percent more in the large truck category.

To put Exhibits IV-4 and IV-5 into context, reference is made to the preceding section in which it was shown that in 1986/87 the Province of Nova Scotia recovered 79 percent of its road expenditures. Consequently, it would require an across-the-board increase of almost

EXHIBIT IV-5

REGISTRATION FEES

(August 1, 1989)

	Trucks with Gross Weight of 25,000 kg.		Trucks with Gross Weight of 50,000 kg.	
	Fees	**Ranking**	**Fees**	**Ranking**
Newfoundland	865	8	1,900	7
Nova Scotia	875	7	1,750	9
P.E.I.	738	10	1,449	10
New Brunswick	955	4	1,907	6
Québec	1,200	1	2,300	3
Ontario	981	5	2,097	5
Manitoba	1,060	3	3,029	1
Saskatchewan	1,160	2	2,921	2
Alberta	787	9	1,890	8
British Columbia	879	6	2,159	4

30 percent in transportation fuel taxes and registration/licence fees to recover fully Nova Scotia's road expenditures based on 1986/87 data.

FUTURE USER CHARGES

The analysis presented in the preceding sections focussed on the past. To complete the analysis, this is a brief look into the future.

Present Highway Policies

The future holds many uncertainties, not only external, such as fuel prices, but also internal to the Government of Nova Scotia, such as policies regarding road user charges. The scenario described below is considered to be reasonably plausible.

The status quo scenario is based on the following assumptions:

- Gasoline tax revenues will increase at an average annual rate of 5.0%. This assumption implies that gasoline prices will increase at the same rate as general inflation (5.0%) and the increase in the number of gasoline-driven vehicles will be offset by a reduction of gasoline consumption per vehicle, as more energy-efficient and smaller vehicles account for an increasingly large percentage of all vehicles in service.

- Diesel tax revenues will increase at an average annual rate of 10.0%. This is composed of a 5.0% increase in fuel prices and a 5.0% increase in the number of trucks based on past trends.

- Registration, licence and other revenues will increase at an average annual rate of 8.0%. That is a composite of 5.0% inflation and 3.0% in the revenue-weighted number of registrations.

If these growth rates are applied to the 1986/87 revenue figures, the following revenues are projected for the years 1989/90 and 2000/2001:

	1989/1990	2000/2001
Gasoline Tax	$104 million	$178 million
Diesel Tax.....	28 million	80 million
Registration, etc.....	50 million	117 million
Total:.....	$182 million	$375 million

EXHIBIT IV-6

PROJECTED REVENUES AND EXPENDITURES
($ 000)

PRESENT HIGHWAY POLICIES — STATUS QUO[1]

REVENUES	1989 Base (1989/90)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Gasoline	104,319	109,535	115,012	120,762	126,800	133,140	139,797	146,787	154,127	161,833	169,925	178,421
Diesel	28,141	30,955	34,051	37,456	41,201	45,321	49,853	54,839	60,323	66,355	72,991	80,290
Lic., Reg. Other	50,311	54,336	58,683	63,377	68,448	73,923	79,837	86,224	93,122	100,572	108,618	117,307
Total:	182,771	194,826	207,746	221,595	236,449	252,384	269,487	287,850	307,572	328,760	351,534	376,018
EXPENDITURES												
Operations	140,000	148,400	157,304	166,742	176,747	187,352	198,593	210,508	223,139	236,527	250,719	265,762
Capital	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000
Total:	250,000	258,400	267,304	276,742	286,747	297,352	308,593	320,508	333,139	346,527	360,719	375,762
Surplus (Deficit)	(67,229)	(63,574)	(59,659)	(55,147)	(50,298)	(44,966)	(39,104)	(32,658)	(25,567)	(17,767)	(9,186)	256

1 Assumes continuation of historical level of capital expenditures (i.e., $110 million per annum) which is insufficient to maintain Nova Scotia's road system to the desired standard.

Operating expenses, amounting to $117.4 million in 1986/87 are assumed to increase at the rate of inflation (5.0%) plus 1.0% per annum for increased workload (including the impacts of growth, partially offset by productivity improvements). That increase would result in total operating expenses of $140 million by the year 1989 and $266 million by the year 2000. Data for all intervening years are shown in Exhibit IV-6, **opposite**.

In the status quo scenario where capital expenses (excluding those covered by transfer payments received by the Province) were $110 million in nominal dollars in all years as has been the case in the past, the deficit would be $67 million in 1989 and would disappear by the year 2000. However, if the $110 million was increased at 5 percent per annum to reflect inflation, the deficit of $67 million would increase to $78 million in 2000.

Future Highway Needs

An annual capital expenditure of $110 million in constant or even current dollars, however, is insufficient to maintain Nova Scotia's road system at the desired standards. In its submission to the National Highway Policy Study, the Province of Nova Scotia indicated that a total of $752 million[6] should be spent on capital construction for the national highway system in order to bring roads up to desired standards and correct current and expected capacity deficiencies. If corrected over the next eleven years (i.e., to the year 2000/2001), annual capital expenditures on average of $68 million (in 1989 constant dollars) would be required over and above the annual amounts stated above.

If present highway policies in regard to road user charges remained in place as described earlier, a deficit of $117 million would be incurred by the year 2000 in order to meet future highway needs as illustrated in Exhibit IV-7, **overleaf**. If the existing $110 million in capital expenditures is increased at 5 percent per annum to reflect inflation, the deficit would increase from $117 million to about $195 million in the year 2000 if existing road user charges continued to apply.

---

[6] Excludes additional four-laning from the New Brunswick border to North Sydney and from Highway 104 to Caribou.

EXHIBIT IV-7

PROJECTED REVENUES AND EXPENDITURES
($ 000)

FUTURE HIGHWAY NEEDS — EXISTING ROAD USER CHARGES

REVENUES	1989 Base (1989/90)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Gasoline	104,319	113,987	124,551	136,094	148,707	162,489	177,548	194,003	211,983	231,629	253,096	276,552
Diesel	28,141	32,071	36,549	41,653	47,470	54,099	61,653	70,253	80,074	91,256	104,000	118,523
Lic., Reg. Other	50,311	54,366	58,683	63,377	68,448	73,923	79,837	86,224	93,122	100,572	108,618	117,307
Total:	182,771	200,424	219,783	241,124	264,625	290,511	319,038	350,480	385,179	423,457	465,714	512,382
EXPENDITURES												
Operations	140,000	148,400	157,304	166,742	176,747	187,352	198,593	210,508	223,139	236,527	250,719	265,762
Existing Capital	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000
Additional Capital	0	71,745	75,333	79,099	83,054	87,207	91,567	96,146	100,953	106,001	111,301	116,866
Total:	250,000	330,145	342,637	355,841	369,801	384,559	400,160	416,654	434,092	452,528	472,020	492,628
Surplus (Deficit)	(67,229)	(135,319)	(134,891)	(134,246)	(133,352)	(132,175)	(130,673)	(128,804)	(126,520)	(123,768)	(120,486)	(116,610)

EXHIBIT IV-8

PROJECTED REVENUES AND EXPENDITURES
($ 000)

FUTURE HIGHWAY NEEDS — INCREASED FUEL TAXES

REVENUES	1989 Base (1989/90)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Gasoline	104,319	113,987	124,551	136,094	148,707	162,489	177,548	194,003	211,983	231,629	253,096	276,552
Diesel	28,141	32,071	36,549	41,653	47,470	54,099	61,653	70,253	80,074	91,256	104,000	118,523
Lic., Reg. Other	50,311	54,366	58,683	63,377	68,448	73,923	79,837	86,224	93,122	100,572	108,618	117,307
Total:	182,771	200,424	219,783	241,124	264,625	290,511	319,038	350,480	385,179	423,457	465,714	512,382
EXPENDITURES												
Operations	140,000	148,400	157,304	166,742	176,747	187,352	[illegible]393	210,508	223,139	236,527	250,719	265,762
Existing Capital	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000
Additional Capital	0	71,745	75,333	79,099	83,054	87,207	91,567	96,146	100,953	106,001	111,301	116,866
Total:	250,000	330,145	342,637	355,841	369,801	384,559	400,160	416,654	434,092	452,528	472,020	492,628
Surplus (Deficit)	(67,229)	(129,721)	(122,854)	(114,718)	(105,176)	(94,048)	(81,122)	(66,174)	(48,913)	(29,071)	(6,305)	19,754

Impact of Increased Road User Charges

There are many possible approaches to increasing road user charges in order to meet future highway needs and substantially reduce the road deficit by the year 2000.

One possible approach[7] would be to raise Nova Scotia's fuel taxes to Québec's level (i.e., the highest level of taxes now employed in Canada). In other words, the diesel fuel tax would be raised by 10 percentage points and the gasoline tax by 11 percentage points. This would be implemented gradually one percentage point a year until Québec's tax level is attained (i.e., in the year 1999/2000 for diesel fuel and in the year 2000/2001 for gasoline). By applying the increase in fuel taxes and the 8% growth rate in registration and licence fees, the deficit could be eliminated by the year 2000/2001 **if** existing annual capital expenditures of $110 million are **not** inflated as illustrated in Exhibit IV-8, **opposite**. If, however, existing annual capital expenditures of $110 million are increased by 5% per year to reflect inflation, a deficit would be experienced. Registration and licence fee revenue would have to increase by about 12% per annum commencing in 1990/91 instead of 8% per annum to reach a break-even situation in the year 2000/2001.

Commentary

Future road user charges are highly dependent on Nova Scotia's future policies regarding the level of highway expenditures and the percentage of highway expenditures to be recovered from road users. Significant increases will be necessary in road user charges if highway revenues are to fully cover those highway expenditures considered necessary by the year 2000 to attain the desired standards for the highway system. Revenue contributions by non-user groups and/or reductions in the standards of Nova Scotia's highway system are policy issues which will also have to be addressed.

---

[7] This approach is used for example purposes only. It is only one of many options available to increase road user charges.

V. TRUCK COSTS AND RATES

In this chapter we examine truck costs and rates in the past, and develop a methodology to estimate costs and rates for the present and future. Data for the historic profile applies to the industry as a whole, while our examination of present and future costs focuses on certain rail competitive moves.

HISTORIC PROFILE

The historic industry profile covers the 12 year period from 1975 to 1986. Four years were selected to represent this period: 1975, 1978, 1982 and 1986. We initially selected 1974, but substituted 1975 due to problems with the 1974 data.

The data sought for each year were: total costs and revenues for the industry, total user charges paid, and average revenue per tonne-kilometre. This information was collected for three purposes:

- to obtain a rough measure of the financial health of the industry;
- to identify trends in the industry over the last 14 years; and,
- to estimate the level of user charges as a percentage of costs and rates.

Data Sources and Limitations

Statistics Canada publications provided basic cost and revenue data, as well as freight flows and revenues per tonne-kilometre. The 1986 data were obtained from **Trucking in Canada** (catalogue 53-222). Information for earlier years was obtained from two publications: costs and revenues were obtained from **Motor Carriers - Freight and Household Goods Movers** (catalogue 53-222), while freight flows and revenues per tonne-kilometre were derived from the **For Hire Trucking Survey** (catalogue 53-224). Our other major data source was the Province of Nova Scotia, which provided fuel tax information and truck registration fee schedules.

EXHIBIT V-1
FINANCIAL DATA FOR FOR-HIRE CARRIERS

DOMICILED IN NOVA SCOTIA

Year	Revenue (000)	Operating Expenses			Operating Ratio
		Total (000)	Fuel (Incl. Tax)	Other Tax & License*	
1975	$48,481	$46,342	10.9%	2.0%	95.6%
1978	$70,831	$66,121	12.5%	1.9%	93.4%
1982	$105,126	$104,574	15.2%	1.6%	99.5%
1986	$138,708	$132,350	14.4%	1.8%	95.4%

DOMICILED IN ATLANTIC PROVINCES (EXCLUDING NOVA SCOTIA)

Year	Revenue (000)	Operating Expenses			Operating Ratio
		Total (000)	Fuel (Incl. Tax)	Other Tax & License*	
1975	$83,861	$80,272	8.6%	1.5%	95.7%
1978	$129,469	$122,876	8.5%	1.1%	94.9%
1982	$246,523	$227,529	10.8%	1.6%	92.3%
1986	$440,124	$416,328	9.0%	1.4%	94.6%

DOMICILED IN OTHER PROVINCES (EXCLUDING ATLANTIC PROVINCES)

Year	Revenue (000)	Operating Expenses			Operating Ratio
		Total (000)	Fuel (Incl. Tax)	Other Tax & License*	
1975	$2,440,447	$2,332,587	8.3%	2.2%	95.6%
1978	$3,820,652	$3,665,952	8.0%	2.1%	96.0%
1982	$5,236,874	$5,116,634	11.2%	1.7%	97.7%
1986	$8,049,250	$7,659,963	9.9%	1.7%	95.2%

* Does not include income taxes

It is important to note that the Statistics Canada numbers do not cover the entire for-hire trucking industry. First, movements of less than twenty-four kilometres are not included. Second, Statistics Canada excludes trucking companies that reported less than $100,000 in revenues during the previous year, as well as couriers, messenger services, and the like. Third, data is generally collected in less detail for small (Class III) companies, so we can only determine revenues per tonne-kilometre for relatively large (Class I and II) carriers. Furthermore, the Statistics Canada class definitions changed slightly during the period of interest. This should not affect the accuracy of calculated ratios, but caution must be exercised when making year-to-year comparisons of aggregate revenues and costs.

Results

Exhibit V-1, **opposite**, provides basic financial data for for-hire carriers. The revenue figures include government payments. Data are shown for three categories: carriers domiciled in Nova Scotia, carriers domiciled in the other Atlantic provinces, and carriers domiciled in the Non-Atlantic provinces. Comparison of the three categories reveals that:

- taxes and licenses as a percent of total operating expenses were slightly higher for Nova Scotia carriers than for carriers domiciled in the other Atlantic provinces, but nearly the same as for carriers domiciled outside of the Atlantic provinces;
- fuel costs were a relatively large percentage of total operating expenses for carriers domiciled in Nova Scotia, perhaps due to the fact that most Nova Scotia trucking companies are small truckload carriers (truckload carriers generally have low overhead expenses because their infrastructure needs are minimal);
- operating ratios are similar among the three carrier groupings; and,
- there is no clear trend in operating ratios (i.e. total operating expenses divided by total operating revenues) between 1975 and 1986.

Exhibit V-2, **overleaf**, summarizes shipment data for the same three carrier categories (more detailed breakdowns are presented in Appendix F). In this case, revenues do not include government payments. We use revenues per tonne-kilometre as a surrogate for rates, since it is very difficult to determine a rate which is "representative". Two points stand out:

- truck rates per tonne-kilometre are generally higher in Nova Scotia and the other Atlantic provinces than in the rest of the country (probably due to shorter hauls); and,

EXHIBIT V-2
SHIPMENTS BY CLASS I & II CARRIERS*

INTRA-NOVA SCOTIA

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$25,918	2,750	488,513	$9.43	$0.053
1978	$28,266	2,404	398,051	$11.76	$0.071
1982	$40,377	2,519.	363,333.	$16.03	$0.111
1986	$50,022	2,849	470,764	$17.56	$0.106

BETWEEN NOVA SCOTIA AND THE ATLANTIC PROVINCES

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$31,263	1,583	661,059	$19.75	$0.047
1978	$28,490	813	392,782	$35.03	$0.073
1982	$53,700	1,150	480,963	$46.70	$0.112
1986	$68,475	1,650	635,025	$41.50	$0.108

BETWEEN NOVA SCOTIA AND OTHER PROVINCES

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$44,251	696	1,073,907	$63.61	$0.041
1978	$43,655	418	664,178	$104.51	$0.066
1982	$90,147	595	903,331	$151.51	$0.100
1986	$117,796	746	1,200,565	$157.90	$0.098

* 1975 & 1978 figures include Class III carriers

- average truck rates have not keep pace with inflation, and rates actually decreased between 1982 and 1986 (perhaps due to greater competition in the industry and a higher proportion of low value commodities now being carried).

Exhibit V-3, **below**, shows provincial fuel taxes and registration charges paid by Nova Scotia domiciled for-hire carriers (supporting calculations are included in Appendix F). User charges appear to have declined when expressed as a percentage of total operating costs. Note that our calculations assume that all fuel was purchased in Nova Scotia, and that all trucks are registered at Nova Scotia rates. While this is not strictly correct, we believe that it provides a reasonable estimate of actual user charges.

EXHIBIT V-3

USER CHARGES PAID BY CLASS I,II & III CARRIERS DOMICILED IN NOVA SCOTIA

(In Thousands of Dollars)

	Prov. Fuel Taxes	Percent of Oper. Costs	Registration Charges	Percent of Oper. Costs	Total User Charges	Percent of Oper. Costs
1975	$1,962	4.23%	$787	1.70%	$2,749	5.93%
1978	$2,479	3.75%	$1,154	1.75%	$3,633	5.50%
1982	$3,131	2.99%	$1,418	1.36%	$4,549	4.35%
1986	$3,694	2.79%	$1,565	1.18%	$5,259	3.97%

EXHIBIT V-4

MAXIMUM VEHICLE WEIGHTS AND DIMENSIONS IN THE PROVINCE OF NOVA SCOTIA

	Nova Scotia Pre-RTAC	*RTAC/MOU Recommendation*	*Nova Scotia Post-RTAC*
Height (metres)	4.15	4.15	4.15
Width (metres)	2.6	2.6	2.6
Length (metres):			
• *Semi-Trailer*	14.65	14.65	14.65
• *Combination*	21.0	23.0	23.0
GVW (tonnes):			
• *Tractor-semitrailer (5 Axles)*	39.5*	39.5	39.5*
• *Tractor-semitrailer (6 Axles)*	48.5*	46.5	48.5*
• *A/C-Train Double (8 Axles)*	Not Permitted	53.5	49.5*
• *B-Train Double (7 Axles)*	50.0*	56.5	53.0*
• *B-Train Double (8 Axles)*	Not Permitted	62.5	58.5*

* Plus tolerance of 500 kg per axle

PRESENT AND FUTURE COSTS AND RATES

The historic industry profile included average costs and revenues for 1986. However, in considering present and future costs and rates we are more concerned with specific, rail-competitive movements. For this purpose, Peat Marwick's truck cost model was used. Estimating costs under the existing regulations was relatively straightforward due to the availability of data on existing truck operations. Developing future cost estimates was more complex as data had to be extrapolated to reflect changes in allowable truck weights and dimensions.

Regulatory Developments

On February 12, 1988, the provinces signed a Memorandum of Understanding (MOU) based on recommendations put forward by the Roads and Transportation Association of Canada (RTAC). Not all of RTAC's recommendations were accepted by the provinces, and existing regulations were generally maintained if they were more liberal than the RTAC standards. Nevertheless, when the Memorandum of Understanding is implemented, there will be (nearly) uniform truck weight and dimension regulations for a system of designated highways across the country.

Exhibit V-4, **opposite**, summarizes maximum truck weights and dimensions in Nova Scotia before and after implementation of the Memorandum of Understanding. Schematics of the various vehicle combinations are included in Appendix F. The most important implication of the changes is that double combinations (particularly B-Trains) will become more practical, due to an increase in allowable combination length and weight. Trucking costs will be affected in three ways. First, the "standardization" of rules will allow for more efficient inter-provincial hauls, regardless of the kind of freight that is being carried. Second, double trailers provide greater cubic capacity, which could lower trucking costs for cube-out freight. Third, allowable payload weights will be significantly greater with B-Trains than with tractor/semi-trailers, which should lower costs for weigh-out freight. This third factor poses the most serious threat to the railways, since a large portion of their revenues is derived from hauling bulk commodities (which weigh out when carried by truck).

Aside from the agreed RTAC changes, it is difficult to predict what regulations will look like in the future. We expect that maximum trailer lengths in Eastern Canada will eventually

increase from 14.65 m (48') to 16.2 m (53'), which could further reduce trucking costs for cube-out freight (this is already happening in Western Canada). Longer trailers would have minimal effect on the railways, however, since they provide no benefit for weigh-out freight.

Review of Previous Work

Several studies have examined how changes to weight and dimension regulations can affect trucking costs. We reviewed two recent studies which we consider relevant to this project. The results are summarized below. It should be pointed out that these studies generally deal with aggregate or average costs for the overall trucking industry, which may not be comparable with costs for particular rail competitive movements under examination in this project.

The first study, entitled **Economics of Truck Sizes & Weights in Canada** [1], was completed before the Memorandum of Understanding was signed. It examined trucking costs under four scenarios of regulatory change. One of these scenarios ("Scenario D") is similar to what was adopted by the provinces, although it assumes more liberal length regulations and slightly different allowable axle loads (in some cases). Our discussion concentrates on Scenario D.

The study results are based on several assumptions: that the provinces will retain their current regulations if they are more liberal than what RTAC has recommended; that loads for inter-provincial hauls are based on the lowest common denominator regulations; that trucks operating within 2% of the existing maximum gross combination weight (GCW) will adjust to the new maximum (if applicable); that truckers hauling cube-out freight will take advantage of the opportunity to use longer trailers; and that all cube-out traffic moving in A- and C-trains will shift to B-trains under the new regulations. Two options were considered for weigh-out freight now moving in A- or C-trains: no change, or a 50% shift to B-trains. It is very important to note that the cost calculations do not consider a possible shift in basic configuration from tractor/semi-trailers to doubles.

---

[1] prepared for RTAC by IBI/ADI, July 1987.

The study estimates that there will be a 9% cost reduction for weigh-out freight moving between Nova Scotia and provinces east of Manitoba, and a 20% reduction for weigh-out freight moving between Nova Scotia and the Western provinces. The calculated cost reduction for cube-out freight moving to/from Nova Scotia was 12%. A large proportion (85-90%) of the total cost reduction is attributed to freight that is now moving in tractor/semi-trailers. There are two reasons for this. First, tractor/semi-trailers dominate the current fleet, especially in the Atlantic provinces. Second, the regulations assumed for Scenario D provide substantial benefits for tractor/semi-trailers - a large cube increase for Ontario, Quebec, and the Atlantic provinces, and a large payload increase for Western Canada. Thus, the study shows significant cost reductions, even without expanded use of doubles.

It is not easy to "adjust" the above estimates to account for differences between Scenario D and the RTAC Memorandum of Understanding. Several factors suggest that the study results may overestimate the actual benefits to truckers: the analysis excluded tertiary roads, but it did not differentiate between "designated highways" and highways where RTAC rules will not apply; and, assumed trailer lengths were longer than those allowed by the RTAC Memorandum of Understanding (which affects costs for cube-out freight). On the other hand, the analysis did not consider the benefits that would accrue to truckers if they replaced tractor/semi-trailers with double combinations.

The second study, entitled **Impact of RTAC Regulations on Trucking in Canada** [2], was completed after the RTAC Memorandum of Understanding was signed. Thus, it was possible to calculate the reduction in costs per tonne-kilometre that could be achieved by shifting freight from configurations that were optimum under the existing rules to configurations that will be optimum when the RTAC regulations take effect. The results indicate a 23% cost reduction for weigh-out freight that has an origin and/or destination in Nova Scotia. The estimated cost reduction for cube-out freight was 8% for intra-Nova Scotia hauls, and 8-9% for hauls with an origin or destination outside of the province.

The above figures do not apply to overall trucking costs. First, not all truckers will shift to the new optimum configurations - in fact, many are not using configurations that are optimum under the existing rules. Second, not all freight moves over designated highways. The author

---

[2] prepared for Transport Canada by F. Nix, November 1988.

of the study made the following assumptions to arrive at his "best estimate" of the overall cost reduction: that 25% of all freight is (and will be) carried in optimum configurations; that 50% of intra-provincial revenues are earned from freight moving over designated roads; and that 90% of inter-provincial revenues are earned from freight moving over designated roads. Taking all of this into consideration, the study results indicate that Nova Scotia trucking costs will decrease by 2.6% for intra-provincial hauls and 5.1% for hauls with an origin or destination outside of the province. Savings for specific carriers could be substantially higher or lower, depending on haul characteristics and the type of equipment used.

Truck Cost Model

Data gathered at this point in the work program were used to update and re-calibrate the Peat Marwick Truck Costing Model. First, it was brought up to current (1988) cost levels. Second, data specific to Nova Scotia and New Brunswick truckers were entered. Finally, a more sophisticated treatment of fuel costs was introduced to reflect more accurately the effects of changes in gross vehicle weight on this cost element. This last adjustment was important in estimating how changes to vehicle weight and dimension regulations will affect truck operating costs.

The primary source of data for the first two changes was the 1988 version of the biannual Trimac/Transport Canada report entitled **Operating Costs of Trucks in Canada**. This source was supplemented with Statistics Canada information to develop certain overhead ratios. The third modification was based on mathematical models of truck fuel consumption[3]. As a result of these changes, we consider the model to be applicable under both present and future operating conditions and practices. The output of our model is not directly comparable to the Trimac figures, however, because of certain methodological differences and our use of supplementary data.

After re-calibrating the model, we applied it to estimate trucking costs for specific "prototype movements" - both before and after implementation of the Memorandum of Understanding. Most of these prototype movements involve freight which weighs out when carried by truck. Our calculations show that trucking costs will be as much as 11% lower once carriers have

---

[3] A. Clayton et al.:"**Heavy Vehicle Fuel Performance in Canada**", prepared for Transport Canada, June 1984.

EXHIBIT V-5

ESTIMATED IMPACT OF THE MEMORANDUM OF UNDERSTANDING ON NOVA SCOTIA TRUCKING COSTS

Source	Cost Reduction Weigh-Out Freight	Cost Reduction Cube-Out Freight
Peat Marwick Truck Cost Model	Up to 11%	Not Calculated*
Economics of Truck Sizes & Weights In Canada	9% Between N.S. & Points East of Manitoba 12% Between N.S. & Western Provinces	12%
Impact of RTAC Regulations on Trucking in Canada	Up to 23%	Up to 8% for Intra-Nova Scotia Hauls Up to 9% for Interprovincial Hauls

* firms selected for prototype movements did not have any cube-out freight

adjusted their fleets to the new rules. Results for specific moves are presented in the following chapter.

Summary

Exhibit V-5, **opposite**, summarizes the output of our truck cost model and the results of the two studies that we reviewed earlier in this chapter. It is difficult to compare the three cost reduction estimates, due to substantial differences in assumptions, methodology, and scope. Nevertheless, it is clear that implementation of the Memorandum of Understanding will significantly reduce trucking costs for many carriers. The trucking industry is very competitive. Therefore assuming everything remains the same (i.e., no increase in road user charges), these savings will likely be passed on to shippers in the form of lower rates.

The trend toward lower user charges (when expressed as a percentage of total operating costs) will likely continue if current policy directions are maintained. Large trucks burn less fuel per tonne of payload than small trucks, and technological advances have brought significant improvements in truck fuel efficiency. Thus, the trucks of the future will generate less fuel tax revenue per tonne-kilometre of freight carried. Registration fees, the other component of user charges, will also be affected. For individual vehicles, fees increase with vehicle weight; however, since large trucks have greater payload capacities, the cost per tonne-kilometre should decline.

VI. RAIL SERVICE IN THE YEAR 2000 — EXISTING POLICIES

The principal contents of this chapter are a profile of rail freight traffic for the year 2000 under existing government policies, corresponding revenues and costs of the future rail traffic, and an investigation of the future financial viability of the Halifax-Moncton and Truro-Sydney rail lines. This chapter begins with an examination of the evolution of rail competitive traffic.

PROJECTIONS OF RAIL-COMPETITIVE TRAFFIC

The existing freight traffic profile is discussed in Chapter III (Nova Scotia Freight Traffic Profile) and in Appendix C (Results of Shipper Survey). This section presents the results of Peat Marwick's projections of future rail traffic. These projections were developed through an examination of expected volume changes for existing and potential rail traffic, and an examination of the possibility of traffic diversions from or to the rail mode.

The planning horizon of most companies does not extend beyond five years. Because of the difficulties in forecasting beyond this time horizon, the projected volumes for carload and container traffic throughout this report actually represent a five-year prediction, with static growth beyond to the year 2000.

Major Volume Changes Forecast for Rail Traffic

Sources used in predicting major volume changes between 1989 and 2000 include the shipper survey undertaken for this study, discussions with economic development officials, discussions with CN Rail, a review of potential projects within Nova Scotia (including APEC's report, "Major Projects in Atlantic Canada: The 1989 Inventory"), and Peat Marwick's own understanding of expected future economic developments in Nova Scotia.

We identified a number of companies whose rail carload volumes may be expected to change significantly to the year 2000. Reasons for changes in volume include the identification of new and expanding markets, projected modal diversion, and the loss of major markets or customers.

Three important observations can be made with respect to carload traffic changes.

Devco — traffic is projected to be sharply affected by the probable development of the Westray coal mine near Pictou. It is assumed in this report that the Nova Scotia Power generating station at Trenton will be supplied from Westray by truck in the early 1990's. Loss of this market will result in a decrease in carload traffic of some 300,000 tonnes on the Truro-Sydney line.

Georgia-Pacific — traffic is difficult to project. Existing higher-grade gypsum is expected to be depleted in roughly five years. Abundant lower-grade deposits exist, but it is not known whether extraction of lower-grade gypsum will be profitable, since it depends on the commodity's future price. This report assumes in its base case that existing carload volumes of 454,000 tonnes will remain steady to the year 2000. Because of the importance of this traffic to the Truro-Sydney line, and the difficulty in predicting future volumes, a scenario reflecting the loss of this traffic was also developed.

Export Flour and Grain — traffic which moved under At & East rates is widely expected to disappear from Halifax as a result of the federal government's elimination of the At & East subsidy effective July 15, 1989. This report assumes that all At & East traffic to Halifax will be lost after this year. At & East traffic to Halifax in 1988 amounted to over 574,000 tons.

Traffic Diversion

Forecasting future rail traffic includes the task of predicting those volumes which are likely to shift from or to the rail mode, primarily due to price or service variations. Our prediction of future traffic diversion is based on two sources: the Peat Marwick shipper survey and our prototype movement analysis.

Shipper Survey

Through the shipper survey we identified two instances where traffic diversion appears highly likely. The more significant instance involves bleached pulp traffic of Scott Maritimes Ltd. destined to the United States. The majority of Scott's traffic which once went by rail is now trucked across Nova Scotia to Sheet Harbour, and thence by barge to U.S. ports. It appears the remaining rail volumes of Scott pulp to the US will soon

shift to this truck/barge move. The traffic in question amounts to some 20,000 tons annually.

The second modal diversion identified through the shipper survey was a diversion of 3000 tons from rail to truck. The shipper mentioned enhanced service as the reason for this probable diversion.

Prototype Movements

The purpose of the prototype movement analysis was to cost a sample of movements as both rail and truck moves, and determine based on the cost results whether a diversion from rail to truck appeared likely. Two sets of truck costs were developed: the costs under the existing regulatory régime, and estimated costs under proposed future regulations which allow for increased vehicle weights and dimensions.[1] The truck and rail costs were estimated using Peat Marwick's proprietary truck costing model and rail cost model. Cost results were checked against applicable rates where made available by the shipper survey. It is recognized that costs do not necessarily reflect rates actually offered to shippers and that other factors (e.g. service) can also determine modal selection.

Several criteria were used in choosing prototype movements for analysis. There had to be a reasonable chance that a truck movement might be cost-competitive with rail (in particular, the commodities should "weigh out" when moved by truck); the movement should be important to the financial health of the rail system; and movements analyzed should represent a cross-section of relevant moves (e.g., some higher-volume, short distance hauls, and some higher revenue, longer distance moves).

Rail costing methods used are described in detail in Appendix G (Rail Costing Methods). Rail cost estimates used in the traffic diversion analysis were developed on the basis of a "compensatory rate" model, since it represents, in effect, the minimum rate which the railway can charge under the law. Truck costing methods are described in Chapter V — Truck Costs and Rates.

---

1 With the exception of container traffic, the future regulations are those that will be in place following the implementation of the RTAC Memorandum of Understanding (MOU). The containers were costed for a twin 45-foot trailer operation, which goes beyond the RTAC MOU, but is a possibility by the year 2000.

EXHIBIT VI-1

SUMMARY OF PROTOTYPE MOVEMENT ANALYSIS
(1988 $)

				TRUCK COSTS			RAIL COSTS
Company	***Commodity***	***Origin***	***Destination***	***Existing Regulations*** $/Tne.	***Possible Reduction***	***Future Regulations*** $/Tne.	$/Tne.
Stora Forest Industries	Wood Pulp	Port Hawkesbury, NS	St. Jerome, QC	$70.87	10.8%	$63.19	$29.14
	100% Backhaul	Port Hawkesbury, NS	St. Jerome, QC	$38.42	8.8%	$35.04	
Devco	Coal	Prince Mine, NS	Point Tupper, NS	$8.78	6.2%	$8.24	$4.52
Georgia-Pacific	Gypsum	River Denys, NS	Point Tupper, NS	$2.28	9.6%	$2.06	$2.52
	Via Trans Canada	River Denys, NS	Point Tupper, NS	$1.86	10.8%	$1.66	
Robb Engineering	Steel Plate	Montreal, QC	Amherst, NS	$54.48	9.7%	$49.19	$23.43
	100% Backhaul	Montreal, QC	Amherst, NS	$29.53	7.4%	$27.34	
Impex Traffic	Containers (12.4 Tonnes/TEU)	Halifax, NS	Montreal, QC	$50.36	34.6%	$32.94	$25.75
		Halifax, NS	Toronto, ON	$71.83	35.1%	$46.61	$34.52

Note: Cost estimates do not represent rates

For each prototype movement, data specific to the move (e.g, trip distance, cargo type, vehicle configuration and weight, rail car type and weight) were input to the respective cost models. The results of the prototype movement analysis are presented in Exhibit VI-1, **opposite**, and discussed below.

Stora Forest Industries — Even under the most optimistic future scenario (including 100% backhaul) the truck cost per ton was calculated to be higher than the rail cost. The movement was considered appropriate to analyze, despite the long trip distance, due to the important contribution made by Stora to the Truro-Sydney line. No diversion from rail to truck can be expected, based on these results. The possibility of a diversion from rail to marine was discounted by Stora officials, when contacted by Peat Marwick. The extra handling required for a marine move would make the likelihood of product damage too high, according to Stora.

Devco — Rail costs were calculated to be significantly lower than truck costs for this move, and no diversion is foreseen. The rail cost shown is estimated to be roughly ten percent higher than the cost actually incurred by CN, but is an accurate reflection of the costs incurred by Devco, when Devco's ownership of coal cars is also considered.

Georgia-Pacific — Truck costs for the gypsum haul via collector and trunk highways were calculated to be slightly lower than rail costs; the motor carrier's cost advantage is somewhat greater if the Trans-Canada Highway is used. However, no adequate road currently exists to connect the old mine site to suitable highways. Construction costs alone (excluding maintenance costs) would likely be over $10 million. A recent study investigating related issues[2] estimated the annualized road-building cost would add $2.25 per ton to the cost of transporting the gypsum by road. This extra cost makes the truck option significantly more costly than the rail mode. Given the fact that required road-building would add considerably to the cost per ton and given the problems of likely traffic congestion on the two-lane highway with intensive use of heavily-laden trucks, and considering that Georgia-Pacific is currently served by a dedicated train, we felt it was unlikely that the gypsum traffic would be diverted from rail to truck.

---

2 ADI Limited, **"Implications of Changes in Rail Service on Development in Nova Scotia"**, January 1989.

Robt Engineering — This company was analyzed to further examine the possibility of diversion for dense commodities moved over longer distances. Under the most optimistic circumstances, truck costs remain higher than estimated rail costs.

Containers — CN had expressed concern that import/export (impex) rail traffic may not be immune from truck competition in the future. Costs for a truck hauling four TEU's on twin 45-foot trailers were estimated to be 28% higher than rail costs from Halifax to Montreal, and 35% higher than rail costs from Halifax to Toronto. Given the price-sensitive nature of impex traffic, there is no threat of diversion from rail to truck.

In summary, the results of the prototype movement analysis indicated that traffic diversion from rail appears unlikely. Furthermore, only modest diversion can be expected based on the results of the shipper survey. These results confirm in a quantitative manner the findings expressed in Chapter III, where Nova Scotia was described as a mature transportation marketplace with expected future modal shifts limited to relatively minor changes.

Viability of Moncton — Montreal Rail Line

The future of the Halifax-Moncton rail line depends in part on the continuing viability of CN's mainline from Montreal to Moncton. Trailer-on-flatcar (TOFC) traffic between Toronto or Montreal and Moncton is one of the most important contributors to this line. Future diversion of trailer traffic from rail to the highway could seriously weaken the viability of the Montreal-Moncton main line and hence threaten the continued existence of the Halifax-Moncton line.

In the longer term future, the possibility exists that twin 45-foot trailer rigs could be permitted if the Trans Canada Highway is completely four-laned between Atlantic and Central Canada. As a result, we costed a trailer move between Moncton and Montreal, and between Moncton and Toronto, based on a twin 45-foot trailer rig and using an assumption of 100% backhaul. For this analysis, we assumed that drayage costs would be similar for a TOFC or twin-trailer movement and did not include drayage costs in the calculation (i.e., the two trailers would originate/terminate at different locations). We estimated the truck costs per tonne were 24% higher than rail costs between Moncton and Montreal, and 34% higher than rail costs between

EXHIBIT VI-2

PROJECTED VOLUMES — YEAR 2000
CN CARLOAD TRAFFIC IN NOVA SCOTIA

(TONNES)

SUBDIVISION[1]	ORIGINATING TRAFFIC	TERMINATING TRAFFIC	TOTAL TRAFFIC
Bedford	3,135,000	408,000	3,543,000
Chester	56,000	37,000	93,000
Dartmouth	169,000	203,000	373,000
Hopewell	68,000	54,000	122,000
Oxford	35,000	58,000	92,000
Springhill	211,000	87,000	298,000
Sydney	941,000	133,000	1,074,000
Total:[2]	4,614,000	980,000	5,595,000

1 Existing CN Rail network in 1989.
2 Discrepancies of totals are due to rounding.

Moncton and Toronto. If drayage costs were in fact significantly higher for the TOFC movement, then the future viability of CN's main line west of Moncton could be less secure.

Projected Carload Volumes for the Year 2000

Exhibit VI-2, **opposite**, presents the projected carload volumes for the year 2000 for each existing CN subdivision. This projection is the result of forecasted volume changes and the traffic diversion analysis described above.

Projection of Impex Traffic Levels

Import and export container traffic through the Port of Halifax has shown strong growth in recent years. After consulting with several sources, including the Halifax Port Corporation, the Halifax-Dartmouth Port Development Commission, and CN Rail, Peat Marwick projected growth in TEU's of 11% for 1989 over 1988 levels, and annual growth of 7% to the year 1994 with volumes remaining constant thereafter to the year 2000.

Several factors exist which could adversely affect growth in impex traffic through Halifax. These factors include the possibility of increased competition from other East Coast ports for container traffic to Montreal and Toronto, and a possible rise in the use of double-stack container trains from the West Coast to these same markets. The viability analysis in the following section recognizes these and other threats, by analyzing a scenario where year 2000 container levels reach only 50% of our projected levels.

VIABILITY ANALYSIS

This section examines the projected financial viability of CN Rail's network in Nova Scotia in the year 2000, by assigning revenues and costs to the traffic profile described in the first part of this chapter. The analysis assesses the Nova Scotia network as a stand-alone entity. Revenues for intra-provincial moves are fully allocated to this entity; for moves which originate or terminate beyond the Nova Scotia network, the revenues are shared between the Nova Scotia entity and the "connecting carrier" (i.e., CN Rail west of Moncton). Moncton was selected as the interchange point (rather than, say, the border with New Brunswick) because of its existing

role as a major intermodal terminal and rail yard.[3] The basis for revenue division is discussed below.

Only those costs incurred within Nova Scotia (including the Moncton stretch) were allocated to the Nova Scotia rail entity; variable off-line costs, for example, were allocated to the connecting carrier. This methodology is akin to a short line feasibility study. Different results would be found under the approach used to assess branch line abandonments, where revenues for the entire haul as well as off-line variable costs are assigned to the branch line under study. We believe the "short line approach" accurately reflects the manner in which a transportation company would assess the financial viability of a regional unit, particularly when considering investment or disinvestment strategies.

The following sections describe in more detail the approach used in deriving revenues and costs.

Revenues

Most of the large rail customers in Nova Scotia were contacted through the shipper survey, and many shippers disclosed to Peat Marwick the rail rates they were paying. Where the volume of a shipment was known, but not its rate, we relied on an average rate supplied by CN. These averages were derived from a matrix of CN 1987 revenues and volumes between Nova Scotia subdivisions and each province.

Payments received from the federal government under the Atlantic Region Freight Assistance Programs were added where applicable to revenues received from shippers.

The 1987 revenues and volumes for container traffic were also supplied by CN, again broken down by originating or terminating province. Average container rates to each province (in 1987 dollars) were applied to the projected year 2000 container volumes.

Revenue Division — Carload Traffic

There is no universal rule governing the procedure for sharing revenues between a regional railway and the mainline carrier to which it connects. Relative length of haul

---

3 Throughout this discussion, reference to the Nova Scotia network includes that section of track from the New Brunswick border as far as Moncton.

(that is, the portion of the move that takes place within Nova Scotia expressed as a percentage of the total trip distance) is an important factor. Although relative length of haul may be the point of departure for negotiation of divisions, other factors will also have an important bearing on the results, including the following:

- the fact that work performed by the regional railway (i.e., way freight/switching operations on low density lines) is inherently costly — and would be avoided by the mainline carrier;
- the mainline carrier's need to cover costs and achieve a worthwhile contribution;
- responsibilities for car supply (mainline vs. regional carrier);
- duties performed in customer servicing, promotion/marketing, billing and revenue settlements (mainline vs. regional carrier).

It is not possible to make a conclusive determination of the impact of the above factors as they might affect divisions for a stand-alone Nova Scotia operation. Ultimately, divisions would result from negotiations in which each party would weigh the relevant factors and seek to achieve a favourable result.

In view of the above, three revenue division estimates were developed for the viability analysis, for carload traffic. These revenue divisions for the regional railway were based on the following:

- ***High:*** The greater of mileage prorate or 30% revenue minimum;
- ***Medium:*** Mileage prorate plus NTA-approved interswitching base rate;
- ***Low:*** Mileage prorate plus a rate per car of $50.

The high division is based on the greater of mileage prorate or 30% of the revenue. Traffic to the Province of Quebec and beyond would qualify for the 30% division. A study of short line railway potential in Ontario[4] suggested some generally agreed upon guidelines for international (cross border) traffic in the U.S. The international rate divisions were based upon mileages established under ICC Docket 28300 class tariffs. Under these tariffs the origin road, regardless of distance, gets no less than 30% of the revenue and intermediate short lines, regardless of distances, get no less than 10%. A

4 Trade and Transportation Group, **"The Potential for Short line Railways in Ontario"**, 1987.

Nova Scotia short line would qualify as an origin or destination road therefore possibly qualifying for 30% of the revenue.[5]

The medium division is calculated using the interswitching base rates determined in the Railway Interswitching Regulation, National Transportation Act, 1987, and an appropriate mileage prorate (subtracting the distances of interswitching zones at each end). The interswitching rate used was $250 per car.

The low division is based on a mileage prorate plus an additional $50 per car. The $50 per car is related to the cost of operating on the branch line and for originating or terminating the movement.

A reasonable range of revenues was determined based upon these three rate division alternatives. We consider that the low division alternative represents a meager sharing of revenue with the regional railway in view of the costly operations it would have to perform. On the other hand, the high revenue alternative may be too costly for the mainline carrier to afford. It is possible that the mainline carrier could allow a 30% division on some of the traffic and still achieve a satisfactory contribution. However, it is doubtful that such divisions would be practical for a large portion of the traffic. The medium rate division appears to be the most realistic of the three alternatives.

Revenue Division — Container Traffic

Container traffic is by far the single most important contributor to the financial health of the Nova Scotia rail network. The majority of the container traffic is between Halifax and the markets of Montreal and Toronto. By costing separately the two legs of each move (Halifax-Moncton and Moncton-Montreal or Toronto) we determined the minimum revenue each carrier (short line and mainline) would require to cover its costs on this traffic. Total revenues (as supplied by CN) were allocated to meet the minimum requirements of each carrier.

---

5 In fact, in the U.S., revenue agreements are not public matters. Therefore it is difficult to determine rate divisions.

EXHIBIT VI-3

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

BASE CASE

1987 $

REVENUES	
Carload	$17,261,000
MFRA/ARFAA Payments	$314,000
Subtotal	$17,575,000
Containers	$1,474,000
Total Revenues	$19,049,000
OPERATING COSTS	
Variable	
Crews	$1,950,000
Fuel	$878,000
Equipment	$3,440,000
Infrastructure	$2,203,000
Other	$1,981,000
Subtotal	$10,452,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$13,140,000
GROSS MARGIN	$5,909,000
OWNERSHIP COSTS	
Variable	
Equipment	$386,000
Infrastructure	$1,352,000
Subtotal	$1,738,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,600,000
PROFIT (LOSS)	$309,000

Note: Base case assumes medium revenue division, Georgia-Pacific and Stora traffic at 100% of forecasted levels, and train service of 6/week.

Costs

Appendix G provides a detailed description of the rail costing approach used. The large majority of moves identified (in terms of volume) were costed individually, using Peat Marwick's proprietary rail cost model. Roughly 5% of the total volume was classed as "residual volumes" whose small amounts made it infeasible to cost directly. In these cases, the average cost per tonne already calculated for the relevant subdivision (i.e., the cost incurred within Nova Scotia) was applied to the residual volume.

The following sections present the results of the viability analysis. The first part of the discussion addresses the Sydney-Truro line, comprising the subdivisions[6] of Hopewell and Sydney. The second part concerns the Halifax-Moncton main line, comprising the subdivisions[7] of Bedford, Dartmouth, Springhill and Chester. The profitability of each subdivision was analyzed separately; results were combined according to the aforementioned groupings.

Future Viability of the Truro-Sydney Line

Exhibit VI-3, **opposite**, presents the base case results for the Truro-Sydney line. The results indicate a modest profit of $300,000 under the base case scenario of medium revenue division, 100% of projected traffic levels for Georgia-Pacific and Stora, and train service of six trains per week.

Exhibit VI-4, **overleaf**, displays the results of the sensitivity analysis, wherein the effects of four factors were explored: division of revenue, future traffic levels for Georgia-Pacific and for Stora, and level of train service. As discussed earlier, it is possible that the gypsum traffic of Georgia-Pacific may cease by the year 2000. Stora volumes appear more secure. Any drop in Stora traffic, though, would have a serious impact on the viability of the line.

Train service between Truro and Sydney currently operates seven days per week. With the projected drop in volume to the year 2000 (especially the loss of coal from the Prince Mine to the Trenton coal plant), we considered service of six days per week to be more likely. Service of five and seven days per week became our low and high options, respectively.

---

6 The eastern part of the Oxford subdivision (from Stellarton to Granton) has been included with the Sydney-Truro line.

7 The western part of the Oxford subdivision (from Oxford Junction to Pugwash Junction) has been included with the Halifax-Moncton line.

EXHIBIT VI-4

YEAR 2000 VIABILITY ANALYSIS -- TRURO-SYDNEY LINE

SUMMARY OF RESULTS

$ 000's

1987 $

Scenario	Revenue Division	<- - - - - Traffic Level - - - - -> Georgia-Pacific	Stora	Train Service per week	Profit (Loss)
Most profitable	High	100%	100%	5	$2,689
Effect of high revenue	High	100%	100%	6	$1,749
Effect of low service	Medium	100%	100%	5	$1,249
Base case	**Medium**	**100%**	**100%**	**6**	**$309**
Effect of high service	Medium	100%	100%	7	($633)
Effect of low revenue	Low	100%	100%	6	($696)
Drop in G.-P. & Stora	Medium	0%	50%	6	($1,353)
Least profitable	Low	0%	50%	6	($2,241)

The profitable scenarios require either a high revenue division or a low service level. While a higher revenue share is a possibility, it appears less likely than the medium division used in the base case. It is difficult to comment on the likelihood of lowering service levels, as they are essentially a negotiable item between carrier and shipper. However, it is possible that the financial results might be less promising than shown here, as shippers may demand lower rates in compensation for lower service levels.

A scenario with traffic levels higher than those used in the base case was not examined, as we found no new economic developments likely to increase future rail traffic significantly.

The unprofitable scenarios involve high service levels, or lower revenue division, or a drop in traffic volumes. In this case, "high" service level actually means the same as the 1989 level: whether shippers could demand the same level of service in the light of projected traffic declines appears unlikely, though not entirely unreasonable. A lower allocation of total revenues to the Truro-Sydney line would have a pronounced negative effect on the line's viability, being over a million dollars short of the base case.

The possibilities of a complete loss of the Georgia-Pacific traffic, and of a 50% drop in Stora traffic were both examined. Of the two, a drop in Stora traffic had a considerably greater negative effect on the line. For reasons of confidentiality, only the scenario of a simultaneous decline in both companies' traffic levels is shown in Exhibit VI-4. The result would be financially disastrous to the line.

Without complete access to CN's costs for the Truro-Sydney line or Halifax-Moncton line, our analysis employed system average costs in some instances. These can be somewhat less precise than actual costs. Hence, findings should be considered as indicative of the true case, rather than an exact result. Considering the insignificance of the contribution over total costs (less than 2%) and the estimations required at several points in the analysis, it appears most reasonable to consider the base case finding as essentially a break-even result.

Summary of Truro-Sydney Line Viability

The sensitivity analysis included some profitable and some unprofitable scenarios. One of the profitable scenarios may be overly optimistic, in particular if rates were to be forced down as service levels declined. The possibility of a loss of Georgia-Pacific rail

EXHIBIT VI-5

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

BASE CASE

1987 $

REVENUES	
Carload	$29,264,000
MFRA/ARFAA Payments	$846,000
Subtotal	$30,110,000
Containers	$46,163,000
Total Revenues	$76,273,000
OPERATING COSTS	
Variable	
Crews	$4,455,000
Fuel	$5,513,000
Equipment	$13,741,000
Infrastructure	$12,117,000
Other	$13,440,000
Subtotal	$49,266,000
Fixed	
Infrastructure	$1,719,000
All Other	$852,000
Subtotal	$2,571,000
Total Operating Costs	$51,837,000
GROSS MARGIN	$24,436,000
OWNERSHIP COSTS	
Variable	
Equipment	$940,000
Infrastructure	$7,311,000
Subtotal	$8,251,000
Fixed (Infrastructure)	$3,695,000
Total Ownership Costs	$11,946,000
PROFIT (LOSS)	$12,490,000

Note: Base case assumes medium revenue division, Chester Subdivision abandoned, and impex traffic at 100% of forecasted level.

traffic is a serious eventuality, one that could jeopardize the line. It appears that almost any drop in traffic levels on the Truro-Sydney line could put the line in an unprofitable position. Moreover, no additions to existing traffic levels were identified.

Faced with a rail line whose most likely future is only a break-even position, with little clearly identifiable prospect of attracting new traffic, and a threat of serious traffic losses, a profit-oriented transportation company would probably not be willing to continue operations indefinitely. Given these financial results and the conditions described, it appears likely that rail service between Truro and Sydney will be discontinued by the year 2000 under existing government policies.

Future Viability of the Halifax-Moncton Line

Exhibit VI-5, **opposite**, shows a profit of over $12 million[8] in the year 2000 as our base case. The most likely outcomes for a number of parameters constitute the base case. Thus, revenues are shared according to the medium division formula; impex traffic is assumed to be 100% of the projection for the year 2000; and the Chester Subdivision is assumed to be abandoned. The National Transportation Agency is currently deliberating on an application by CN to abandon part of the Chester Subdivision. Based on our findings, it seems likely that CN may apply to abandon the remainder of the subdivision by the year 2000. The base case profit amounts to a 20% contribution over total costs.[9] Considered in absolute terms ($12 million) or in relative terms (20% contribution), we consider such a profit as satisfactory to a profit-oriented railway.

Exhibit VI-6, **overleaf**, is a summary of the results of our sensitivity analyses conducted on the Halifax-Moncton line, shown in descending order of profitability. According to the results of our short line analysis, the Chester Subdivision was unprofitable.[10] Thus, the highest returns on the Halifax-Moncton line occur with a high revenue division, and the abandonment of the Chester Subdivision. The next scenario in Exhibit VI-6 reflects retention of the Chester Subdivison and holding the other two conditions constant.

---

8 All dollar figures quoted are in 1987 dollars.

9 Profit + (Operating + Ownership Costs).

10 Again it must be noted that our short line analysis differs from the analysis used in a branch line abandonment process. Results from the two approaches are not directly comparable.

EXHIBIT VI-6

YEAR 2000 VIABILITY ANALYSIS -- HALIFAX-MONCTON LINE

SUMMARY OF RESULTS

$ 000's

1987 $

Scenario	Revenue Division	<- - - - - - Traffic Level - - - - - -> Chester Sub.	Impex Traffic	Profit (Loss)
Most profitable	High	0%	100%	$18,297
Effect of high revenue	High	100%	100%	$15,573
Base case	**Medium**	**0%**	**100%**	**$12,490**
Chester retained	Medium	100%	100%	$9,358
Drop in impex traffic	Medium	100%	50%	$6,118
Effect of low revenue	Low	100%	100%	$5,584
Least profitable	Low	100%	50%	$2,344

The finding that the Chester Subdivision is projected to be unprofitable under existing government policies is not intended as a recommendation for abandonment. Chapter VII explores alternatives to preserve and promote the use of rail in Nova Scotia.

Our sensitivity analysis included four scenarios where the return was less than the base case. If the Chester Subdivision was retained at the medium revenue division, profits would decrease by over $3 million/year from the base case. If impex traffic reached only 50% of our projected year 2000 levels, due to one or more factors previously mentioned in this chapter, profits would drop by another $3 million/year. If revenue allocated to the Halifax-Moncton line was a smaller share of the total (e.g., using the low division instead of the medium division) profits decline slightly more and the profitability of the line begins to become marginal. It should be futher mentioned that abandonment of the Truro-Sydney line would also have a negative impact on the viability of the Halifax-Moncton line.

Appendix H shows full financial viability statements for each of the above-mentioned scenarios.

Summary of Halifax-Moncton Viability

The results of the base case and sensitivity analysis indicate the Halifax-Moncton rail line will continue to be profitable in the year 2000 under existing government policies. Profits are highly sensitive to impex traffic levels in particular, as this container traffic is the largest contributor to the viability of the line. Thus, while the Halifax-Moncton line's future appears relatively secure, it would be prudent to support whatever actions may strengthen the security of the line's future viability.

Reduction in VIA Rail Services

The following regional rail diesel car services are among the VIA routes which will be discontinued January 15, 1990:

- Halifax-Yarmouth
- Halifax-Port Hawkesbury
- Halifax-Sydney
- Halifax-Moncton-Saint John

A reduction in VIA services entails a reduction in payments from VIA to CN, which covered costs of maintenance, ownership of track and roadway, and some signalling and dispatching costs. We believe CN will be unaffected in the long run by the loss of these payments, mainly because CN can save on future maintenance costs. (In general, track infrastructure being used exclusively by freight trains does not require the same degree of maintenance or signalling complexity as track infrastructure used by rapid passenger trains.)

In the short run, CN will continue to incur some unavoidable costs despite the reduction in passenger rail service. Peat Marwick estimated these short run unavoidable costs to be $375,000 per year on the Truro-Sydney line and $540,000 on the Halifax-Moncton line.[11] These short-term costs are not expected to threaten the relatively secure viability of the Halifax-Moncton line. However, the loss of VIA payments could provide greater incentive to CN to abandon the Truro-Sydney line.

CONCLUSIONS

Under existing government policies, by the year 2000 the railway network in Nova Scotia will be effectively reduced to the Halifax-Moncton rail line comprised of the former CN Rail subdivisions of Bedford, Dartmouth and Springhill. The CN Chester Subdivision will have been abandoned and CP Rail's Dominion Atlantic Railway would likely be reduced to a 16 km privately-owned short line railway operating between Mantua and Hantsport transporting large volumes of gypsum (1.5 million tons annually) destined for U.S. markets.

A number of consequences can result from the abandonment of rail line:

- traffic congestion on highways is increased if former rail traffic is diverted to the truck mode. This leads to faster road deterioration unless highway maintenance expenditures are increased;
- public exposure to **dangerous goods** and possible accidents would be increased. For example, inbound commodities for Stora Forest Industries and outbound products for Canso Chemicals such as chlorine and caustic soda would now be hauled over the road. Other dangerous goods such as propane would also now depend upon truck transport;

---

11 The figure for the Halifax-Moncton line is based on complete elimination of VIA services between Halifax and Moncton. With transcontinental service continuing in the 1990's, CN's unavoidable short run costs will in fact be lower than $540,000.

- opportunities for new economic development are impaired by the disappearance of a rail infrastructure.

With regard to the Truro-Sydney line, many shippers who now depend on the line (e.g., Stora Forest Industries, Canso Chemicals, Michelin Tire, Trenton Works Lavalin Inc. and Sydney Steel) would experience increased shipping costs and a reduction in customer service levels. This would lead to a loss of markets and possible plant closures. Sydney Steel and Trenton Works Lavalin Inc., as builders of steel rails and railway cars, respectively, would face particular hardships. There appears to be little that current users of the Truro-Sydney rail line can do to improve the line's prospects. A lower level of service (and hence, lower costs to CN) would improve the viability of the line but could negatively affect shipper's production schedules, inventory costs, and competitive position in general. Other initiatives to reduce costs, such as crew size reductions, are beyond the direct influence which shippers can exert.

Any material increase in revenues for the line will have to come from new economic development projects, since volumes for existing users are not expected to increase significantly. However, future economic developments are still at the tentative stage. No new projects could be confirmed at this time which were likely to contribute significant traffic to the rail line.

In the event of abandonment by CN, there are a few possibilities for maintaining partial rail service. Georgia-Pacific gypsum is currently served by a dedicated train. This short haul, high volume move is a potential candidate as a short line operation. However, the uncertain future of the gypsum mine decreases the likelihood of such a development.

A second possibility is the operation by Devco of a private railway from the Sydney area to Point Tupper. The necessary expertise is already present, since Devco currently operates a railway in industrial Cape Breton. Moreover, Devco owns a fleet of coal cars. Devco would likely require an assured market for their coal at the Point Tupper generating station before seriously considering such a venture.

The remaining shippers on the line have fewer options and face increased financial and operational difficulties as outlined above. Preservation of the Truro-Sydney rail line is therefore a matter of great importance.

VII. CONCLUSIONS AND RECOMMENDATIONS

Trucking is and will continue to be the predominant mode of surface freight transportation in Nova Scotia. This is due primarily to its inherent cost and service advantages over rail for many types of traffic other than for certain bulk commodities. The growth of trucking has led to significant declines in rail service even though rail transportation remains essential to certain shippers. Government transportation policy at both the federal and provincial levels has also contributed to this predicament. The future of direct rail service in Nova Scotia, other than the Halifax-Moncton main line, is very much uncertain as the Province enters the 21st century.

PRESENT SURFACE TRANSPORTATION SITUATION

The study results present the picture of a mature transportation marketplace in Nova Scotia with little carload traffic remaining which could be diverted from rail to truck. Most of the traffic diversion has already taken place. The remaining carload rail traffic in Nova Scotia is not considered truck competitive, due to high volumes or long distances. For the majority of remaining carload shippers, the rail mode is very important or indispensable to their operations. There is, however, active competition between motor carriers and rail intermodal although at present intermodal operations use Nova Scotia's road system to/from CN Rail's intermodal terminal located at Moncton, New Brunswick. Marine transportation can also be a competitive alternative to rail transportation in certain instances, particularly for shipments of forest products to the eastern United States.

While the Province of Nova Scotia provides highway infrastructure, it does not recover the full cost of the roadway network. In the 1986/87 fiscal year, the Province recovered 79 percent of its road-related expenses of $207 million (capital and operating) in the form of road user charges (e.g., fuel taxes, vehicle registration fees, tolls). Cost recovery is only 65 percent if municipal road-related expenditures in the amount of $44 million are also taken into account.[1] When compared with some other Canadian provinces, Nova Scotia had a higher cost recovery

---

1 Recovery ratios were similar for the 1987/88 fiscal year.

ratio than New Brunswick[2] but a lower cost recovery ratio than those of Quebec, Ontario and Manitoba.

It is significant to note that Nova Scotia's current level of roadway expenditures **is not adequate** to correct existing deficiencies in road standards as well as capacity deficiencies. Based on figures submitted for the National Highway Policy Study, Nova Scotia is underspending on average $68 million per year.[3]

Railways are responsible for the ownership and operating costs of both the train services and infrastructure on which they operate. The study findings indicate that at present, CN Rail fully recovers its costs for the principal rail lines which it continues to operate in Nova Scotia. The Halifax-Moncton line is reasonably profitable. The Truro-Sydney rail line, however, is effectively only in a break-even situation.

The financial performance of Nova Scotia's trucking industry has been reasonably stable in the past and is comparable with the Canadian average despite a levelling off of rates in recent years. However, the financial performance of the Canadian trucking industry appears to have deteriorated over the past year due to the unfolding effects of deregulation, and escalating competitive market pressures. Increased truck weights and dimensions may provide some cost relief for the industry in the longer term. It is interesting to note, however, that road user charges as a percentage of total operating costs for motor carriers domiciled in Nova Scotia has declined over the period 1975 to 1986.

FUTURE SITUATION UNDER EXISTING GOVERNMENT POLICIES

The continuation of existing government policy at both the federal and provincial levels will probably lead to further deterioration of Nova Scotia's freight transportation system. By the turn of the century:

- **the highway network** will have further deteriorated in the face of growing traffic demands unless a higher level of funding is provided, possibly through increased user charges dedicated to the highway system;

---

2 With the establishment of the "Highway Trust Fund", New Brunswick may now have a higher cost recovery ratio than Nova Scotia.

3 The $68 million annual funding deficiency in constant dollars is based on the $751.6 million that would be required to upgrade the system within an 11-year time frame to the year 2000/2001.

- **the railway network** will be effectively reduced to the Halifax-Moncton mainline. The Chester Subdivision will have been abandoned and CP Rail's Dominion Atlantic Railway will be reduced to a 16 km privately-owned short-line railway operating between Mantua and Hantsport to transport gypsum. Even the future of the Halifax-Moncton line faces a degree of uncertainty since it is highly dependent on the future volumes of import/export containers which in turn depend on a number of global factors.

The possible abandonment of the Truro-Sydney rail line is the most serious concern. This would substantially harm certain shippers who now depend on the line. These include Devco (coal), Georgia-Pacific (gypsum), Sydney Steel, Stora Forest Industries (newsprint and pulp), Canso Chemicals (chlorine and caustic soda), Trenton Works Lavalin Inc.(railway cars and axles), and Michelin Tire. It would lead to significantly increased shipping costs which would have a detrimental effect on the shippers' ability to serve their markets. In today's competitive environment, the results could lead to plant closures.

The impact on future economic development resulting from abandonment of the Truro-Sydney rail line is difficult to assess since no specific developments which would depend on rail service were identified. However, there is sufficient evidence of potential developments described in Chapter II to demonstrate the Government of Nova Scotia's stated concern that future regional economic development would be hindered by the loss of transportation infrastructure — particularly, the abandonment of the Truro-Sydney rail line.

Safety and environmental impacts of loss of the Truro-Sydney line are additional serious matters, although they are more difficult to assess. In addition to increased truck traffic on the highways, the transport by road of dangerous commodities such as chlorine, caustic soda, and propane will increase public exposure to dangerous goods and the associated risks of an accident.

In conclusion, further deterioration of the existing surface transportation system in Nova Scotia will occur unless action is taken to:

- preserve the Truro-Sydney rail line;
- enhance the economic viability of rail operations;
- support expansion of domestic intermodal service (e.g., piggyback);
- provide highway funding sufficient to meet the Province's needs.

ISSUES AND CONSTRAINTS

It is recognized that the Province of Nova Scotia faces a number of issues and realities in implementing transportation policies which can overcome the threat of further deterioration of the surface transportation system. These are discussed below.

Policy Action Limitations

The Province of Nova Scotia is limited in its ability to influence and achieve the appropriate roles for the freight modes for a number of reasons:

1. **Disparate modal jurisdictions** (i.e., rail is federal, road is provincial) impede the optimization of roles for the freight modes. The Federal Government is reducing its financial commitment of the rail mode, which is placing added pressure on the provinces to increase their financial support of the surface transportation system[4] and/or find additional revenue sources (e.g., increase user charges). This will not likely lead to the best transportation system solution.

2. **The interdependence of policies** at the provincial level requires that Nova Scotia coordinate its efforts with the other provinces. Central Canada (i.e. Ontario and Quebec) highly influences the transportation policies of the Atlantic Provinces (e.g. 53-ft trailers). Secondly, policies within Atlantic Canada, in particular, the surface transportation policies of the Province of New Brunswick (e.g. four-laning of the Trans-Canada Highway) influence directly the road and rail modes in Nova Scotia. Policies can become ineffective or even counter-productive if not coordinated.

3. **The influence of external market forces**, both on a global basis (e.g. Far East container traffic) and in Canada (in particular, Central Canada) influence distribution patterns and modal selection. For example, due to the high level of truck use in Canada's industrial heartland to and from its various markets, there is a tendency to favour the truck mode for the transport of goods moving between Nova Scotia and Central Canada.

4. **Constrained financial resources** limits the Province's ability to meet all its social and economic responsibilities. In addition, less federal assistance may be forthcoming in the future due to the budgetary constraints of the Federal Government.

---

4 The provinces are now under pressure to increase funding of the road system which is sustaining increased freight traffic, as well as to consider funding of rail operations which will no longer be subsidized by the Federal Government.

Road Costs and User Charges Dilemma

Considerable research and policy development (particularly in the United States) has been devoted to the subject of highway finance. Debate has become more intense in recent years as governments face increasing demands to rehabilitate and upgrade the road network in an era of fiscal restraint.

Revenues generated by traditional user charges (e.g., vehicle registration fees, fuel taxes) do not adequately reflect the highway costs that the various classes of highway users are responsible for. In effect, automobiles and lighter vehicles subsidize heavier vehicles whose user charges do not generate sufficient revenues to cover the highway costs that they cause. Many U.S. states have introduced third structure user charges which levy weight-distance taxes (in various forms) on heavy vehicles which partially or completely replace the diesel fuel tax.

The Province of Nova Scotia would have difficulty dealing with this matter in isolation. However, the subject should now be addressed in depth by all the provinces working in consort. Comprehensive highway finance policies should be developed in Canada as many U.S. states have decided to do, even though it may not be possible to resolve all of the controversies.

Feasibility of Increased Motor Carrier User Charges

Transportation policy affects the distribution costs of Nova Scotia's shippers and receivers. The competitiveness of Nova Scotian industry must be maintained in North American and world markets. Transportation costs play an important role in this regard. Any policy change which affects distribution costs, particularly if made unilaterally in respect of other Canadian provinces must be assessed very carefully.

Increases in road user charges should result in a number of benefits to the Province of Nova Scotia including:

- the highway carrier mode contributing a more equitable portion of highway revenues;
- an improved road network or reduced highway budget deficit due to greater highway revenues;

- the enhancement of the economics of intermodal rail (e.g., piggyback) vis-à-vis the motor carrier which in turn would decrease the traffic load on the highways and improve rail viability.

Due to the marginal profitability of many Canadian freight carriers, it is highly likely that a rapid increase in road user charges (e.g., for heavier vehicles) would be passed along (at least partially) to Nova Scotia shippers.[5] Secondly, evidence suggests that increased user charges are unlikely to direct traffic back from truck to rail. However, with the economic benefits deriving from larger vehicle weights and dimensions, a gradual increase in road user charges could be introduced, with Nova Scotia shipper/receiver costs being largely unaffected.

Viability of Nova Scotia Carriers

As indicated above, it is probable that the Nova Scotia trucking industry cannot absorb rapid increases in user charges without increasing rates to shippers or undergoing financial hardships. Increases in road user charges should be phased in gradually for reasons stated previously. Although not a major issue in Nova Scotia, the viability of Canadian versus U.S. truckers should also be considered in development of a road user charge policy.

As previously noted, it is important to facilitate railway financial viability — both in Nova Scotia and in the rest of Canada. Railways are responsible for providing and maintaining their own fixed plant, while the trucking industry uses the highway system built by the public sector. In most provinces, the railways are required to pay fuel taxes which the railways argue is unfair because they are providing their own infrastructure. The railways' position is logical and warrants consideration. However, most provinces will probably find it difficult to discontinue charging locomotive fuel taxes, as they have come to rely on this source of funds.

Nova Scotia is the only province which does not levy a provincial tax on locomotive fuel. Thus Nova Scotia is already pursuing an enlightened policy, and can do little more in the area (apart from encouraging other provinces to do the same).

---

[5] This result was evident in New Brunswick upon implementation of the "Highway Trust Fund".

Rail and Trucking Distrust

Intense competition between the rail and truck modes over the years has led to a degree of distrust between the two modes. This mistrust was manifested in the course of the carrier survey.

Greater cooperation between road and rail carriers in the use of rail intermodal service could be to the net benefit of both parties, as well as to the Province of Nova Scotia.

RECOMMENDATIONS

In context with the requirements and constraints outlined above, we recommend the following actions to achieve the appropriate roles for the freight modes into the 21st century.

Preservation of Truro-Sydney Rail Line

Our findings indicate that this rail line is presently in a break-even situation. The rail line is in good physical condition and is indispensable to a number of shippers. There is also some potential economic development in the region served by the line. In addition, traffic through Sydney Harbour Ports and/or the Strait of Canso Ports may increase if economic or port development initiatives come to fruition.

It is therefore recommended that avenues be explored to preserve the line, including the possibility of creating a **short line railway** to operate the line. It is important to address this opportunity **while the line is still in good condition and shippers remain**. To wait until the line is about to be abandoned may be too late to preserve the opportunity of a viable short line operation.

If subsidization of the short line operator appears necessary, the Province should give serious consideration to acquiring the rail infrastructure. The rail plant then could be rented back to the operator at a fee which would permit the operation to be financially viable. As evidenced in the viability analysis, the rail plant ownership costs constitute a significant element of total costs.

The Government of Nova Scotia should commence exploratory discussions immediately with CN Rail in regard to the above.

Highway Finance Policies

Comprehensive highway finance policies should be developed, and revisions made to the existing system of road user charges. The matter is highly complex and requires initiative at the national level by **all** the provinces to agree on a common set of principles and framework for highway finance in Canada. The Province of Nova Scotia should encourage this initiative, within which the Province's own policy can be established.

In developing a highway finance policy, the Province of Nova Scotia should proceed as follows:

- the implementation of changes in road user charges including increases for heavier vehicles should be implemented **gradually** over a reasonable period to minimize the impact on Nova Scotia shippers and carriers;
- increases in road user charges for heavier vehicles should be timed to coincide with realization of the economies of increased weights and dimensions which are beginning to be felt by the trucking industry;
- highway finance policy should incorporate a direct relationship between road user charges and highway expenditures, possibly with dedicated highway funding for particular projects (e.g., four-laning);
- third structure taxation should be seriously considered in the longer term.

Rail Intermodal Terminal in Halifax

The establishment of a rail intermodal terminal in Halifax is important for a number of reasons:

- it would improve the financial viability of the Halifax-Moncton rail line;
- it would remove truck traffic from the highway between Halifax-Moncton;
- it may benefit some shippers in the Halifax-Dartmouth area in terms of better service and possibly lower costs in the longer term.

The Province should meet with officials of the Port of Halifax, CN Rail and possibly the City of Halifax and the Halifax-Dartmouth Bridge Commission and take whatever steps are appropriate to pursue the development of this facility.

Intermodal terminals in other locations (e.g., Truro, Sydney) might also be considered in the longer term.

Road and Rail Cooperation

The Province should take a lead role to improve relations between the two surface modes in order to increase the use of rail intermodal. One option is for the railway to become a "wholesaler" of intermodal services with the truckers becoming the "retailers" dealing directly with the shippers. Volume guarantees, possibly through confidential contracts, would enable CN Rail to maintain traffic volumes and to generate revenue. Truckers would benefit from increased traffic volume and possibly lower costs, particularly if fuel prices rise in the longer term.

The desired railway/motor carrier cooperation — in either the above form or some other arrangement — is unlikely to evolve rapidly on its own. The Province should support a facilitation program to explore and promote road/rail cooperation. The action required includes:

- identification of the specific traffic at issue;
- the benefits sought by each mode;
- the impediments to be overcome;
- and how the desired results can be achieved.

Reduction in Carrier Costs

The Province should support, to the extent practical, policies which reduce carrier costs — both rail and truck. Both modes are at a disadvantage in respect of corporate income tax vis-à-vis U.S. carriers. The railways face regulatory and institutional burdens which inflate their cost structures. For example, reduction in train crew sizes, as have been achieved by many U.S. railways for intermodal trains would greatly benefit Canadian intermodal operations.

We appreciate that changes of the type suggested above are beyond the direct control of Nova Scotia (or any other province). Nevertheless Nova Scotia is already supporting rail transport by refraining from rail diesel tax, and may be able to lend some indirect assistance in other matters affecting carrier costs as the Province plays its role in various political and social forums.

The continued viability of the Halifax containerports and the associated container rail movements are of first importance to the Province. Double-stack rail service has been shown to have significant potential for reducing the cost of the rail movement.[6] The Province should take every reasonable measure to assist the introduction of double-stack service, possibly to the extent of assisting financially in the launching of a pilot service.

Trenton Works Lavalin has the capability to build double-stack rail cars. The company presently has an order with CN Rail to supply new technology intermodal piggyback cars which can handle double-stack containers. The Province should explore the feasibility of facilitating the introduction of double-stack service, with the required cars being built at Trenton.

Provincial and Federal Policy Cooperation

Greater policy cooperation between the federal and provincial governments is clearly necessary, particularly in this era of fiscal restraint. It is becoming apparent that present government policy combined with budgetary constraints is leading to gradual deterioration of Canada's freight transportation system. A sub-optimal transportation system will be detrimental to the Canadian economy in the longer term.

The Province of Nova Scotia should encourage the Federal Government to consider its role and responsibilities under the National Transportation Act, 1987, particularly in respect of regional economic development. The Province should work closely with the Federal and the other provincial governments in the development of transportation policy which will achieve the appropriate future modal roles into the 21st century.

---

6 See **"Halifax Load Centre Cost Analysis"** — Chapter V (Double-Stack Rail Service), Peat Marwick Consulting Group, March 1988.

KPMG Peat Marwick

NOVA SCOTIA
DEPARTMENT OF TRANSPORTATION
AND COMMUNICATIONS

SURFACE FREIGHT TRANSPORTATION: ALTERNATIVES INTO THE 21ST CENTURY

TECHNICAL APPENDICES

PEAT MARWICK STEVENSON & KELLOGG

NOVEMBER 1989

APPENDICES

A. CONTACTS AND DOCUMENTATION

B. TRAFFIC STATISTICS

C. RESULTS OF SHIPPER SURVEY

D. CN RAIL PLANT

E. ROAD REVENUES AND EXPENDITURES

F. TRUCK COSTS AND RATES

G. RAIL COSTING METHODS

H. YEAR 2000 VIABILITY STATEMENTS FOR HALIFAX-MONCTON AND TRURO-SYDNEY RAIL LINES

I. HIGHWAY FINANCE BIBLIOGRAPHY

APPENDIX A

CONTACTS AND DOCUMENTATION

CONTACTS AND DOCUMENTATION

GOVERNMENT POLICY AND GOALS

CONTACTS AND INTERVIEWS

Nova Scotia

- ***Transportation and Communications***

  Don MacDougall — Director, Transportation Policy

  Don Stonehouse — Assistant Director, Transportation Policy

- ***Industry, Trade and Technology***

  Dick Fletcher — Industrial Benefits

  Rick Butler — Industrial Benefits

- ***Lands and Forests***

  Marvin MacDonald — Planning and Development Officer

- ***Agriculture***

  Dave Robinson — Economist

- ***Mines and Energy***

  Dan Murray — Director, Mineral Development

New Brunswick

- ***Transportation***

  Doug MacIntosh — Director

Ontario

- ***Transportation***

  Norm Mealing — Executive Director, Provincial Transportation

  Ian Chadwick — Manager, Rail Office

  Robert Pillar — Transportation Capital Branch

  Paul Askie — Head, Truck Policy Section, Motor Carrier Policy Office

  Rod Taylor — Head, Distribution Policy Section, Goods Distribution Systems Office

Québec

- ***Ministère des Transports***

  Pierre Perron — Chef du Service de la réglementation économique, Direction du transport routier des marchandises

  Pierre Toupin — Chef du Service, Service de la planification routière, Direction générale du Génie

  Paul-André Fournier — Chef du Service du transport ferroviaire, Direction du transport ferroviaire

  Michel Champoux — Agent de recherche, Direction du transport ferroviaire

Federal

- ***Transport Canada***

  Clyde McElman — Director, Rail Freight Programs

  Peter Hoisak — Director, Rail Freight Policy

  John Pringle — Director, Motor Carrier

  Yves Malépart — Director, Highway Policy and Programs

  Derek Sweet — Regional Director, Maritimes, Policy and Coordination (Moncton)

  Ghyslain Blanchard — Policy and Coordination, Maritimes (Moncton)

- ***National Transportation Agency***

  Mike Parry — Director General, Transportation Subsidies

  Neil Thurston — Director, Rail Rationalization

DOCUMENTATION

Nova Scotia

P.C. Party of Nova Scotia Policy Papers, "Strong Leadership for New Ideas"

Executive Summary of Strategic Government Priorities 1988-91, Nova Scotia Executive Council, Policy Board

Program Planning Process, Phase Two Update 1988-91, Dept. of Transportation

White Paper on Economic Development, Nova Scotia Department of Development

Atlantic Provinces Economic Council, "Major Projects in Atlantic Canada: The 1989 Inventory", April 1989

New Brunswick

Green Policy Paper, "Adequate Highways, A Key to Regional Economic Development", August 1988

Ontario

Future Perspective, 1988-2008, Ontario Provincial Highways, Highway Planning Office, Ontario Ministry of Transportation

Québec

Transportation in the Montreal Region, 1988-1998 Plan of Action, Summary

New Rules Regarding Québec Trucking, Direction du transport routier des marchandises, October 1988

Federal

Rail Line Abandonments: An Overview, National Transportation Agency

Annual Review 1988, National Transportation Agency

CONTACTS — CARRIER STUDY

CN RAIL (ATLANTIC REGION)

- Howard Easton — Assistant Vice-President
- Claude Poirier — Manager, Research Services
- Mary Taylor — Regional Manager, Sales and Services
- Daniel Leblanc — Market Manager
- Wayne Richardson — Engineer Track (East)
- Jack MacDonald — Bridge Engineer
- Officials of Moncton Intermodal Terminal

ATLANTIC PROVINCES TRANSPORTATION COMMISSION

- Ramsay Armitage — General Manager

TRUCKING

- G.M. Armour & Son Ltd., Wes Armour — President and General Manager
- Atlantic Provinces Trucking Association, Dale Elliot — Executive Director
- Day & Ross, Terry Ivany — President and Chief Executive Officer
- Eassons Transport Ltd. — Paul Easson — Secretary-Treasurer
- Maritime-Ontario Freight Lines Ltd., Doug Munro — Vice-President
- Midland Transport Ltd., Roy Gillies — General Manager
- Thompson's Transfer Co. Ltd., Dick Thompson — Vice-President and General Manager
- Pole Star Transport Inc., Roger Sellick — General Manager
- CP Express & Transport, John Klassan — Director, Corporate Affairs

MARINE CARRIERS

- Marine Atlantic Inc., Bob Milne — Manager (North Sydney)
  Don McCully — Digby Terminal Manager
  Len Rhyno — Yarmouth Terminal Manager
  Roger Arsenault — Marketing
  Eric Vardy — Marketing
- Atlantic Searoute Ltd., Jim Stoneman — General Manager
  Roger Swallow — Commercial Manager
- U.M. Holdings Ltd., Mary Slaunevaile

PORTS

- Halifax Port Corporation, David Bellefontaine — President
  Robert Kaye — Vice-President, Marketing
  Lori Rafter — Marketing Statistics
- Harbours & Ports Directorate, Bill Beck — Regional Manager
- Sydney Harbour Ports Regional Development Board, Bill Butler — President
  A. Bruce McDonald — Past President
  Tom Sainthill — Vice-President
  John Shaw — Executive Director
- Halifax-Dartmouth Port Development Commission, Patricia McDermott—Director of Marketing

LABOUR AND MUNICIPAL CONTACTS

CANADIAN BROTHERHOOD OF RAILWAY TRANSPORT AND GENERAL WORKERS

Ted Powell, Halifax Representative
Gary Murray, Moncton
Victor Tomiczak, Sydney Representative
Clarence Musgrave, Sydney, Chairman of Local 11

STRAIT OF CANSO

George Beasley, Director, Port Hawksbury Industrial Commission
Francis Gillis, Industrial Development Officer, Inverness County

PICTOU, STELLARTON, NEW GLASGOW

Bill MacCulloch, Executive Director, Pictou County Research and Development Commission

HALIFAX

Doug Corkum, Director, Halifax Industrial Commission
Bill Campbell, Senior Planner, City of Halifax

SYDNEY

Kevin McDonald, City Engineer, City of Sydney

DARTMOUTH

Tom Rath, Director, Industrial Development

APPENDIX B

TRAFFIC STATISTICS

TABLE B-1

1987 FOR-HIRE TRUCK VOLUMES AND REVENUES (Class I, II & III

ORIGIN/DESTINATION	TO NOVA SCOTIA		FROM NOVA SCOTIA	
	TONNES (000's)	REVENUE ($)[1] (000's)	TONNES (000's)	REVENUE ($)[1] (000's)
Newfoundland	109	5,913	112	11,830
Prince Edward Island	74	2,263	157	5,212
Nova Scotia	4,468[2]	71,973[2]	4,468[2]	71,973[2]
New Brunswick	861	38,212	577	21,279
Québec	223	31,469	123	8,441
Ontario	308	56,557	223	19,306
Manitoba	10	3,232	2	1,623
Saskatchewan	—	192	—	328
Alberta	6	1,866	4	1,977
British Columbia	5	3,097	2	2,467
Yukon	—	239	—	8
North West Territories	—	291	—	21
Sub-total—Canada:	6,066	215,305	5,668	144,467
U.S.	70	11,979	73	8,773
GRAND TOTAL:	6,136	227,284	5,741	153,240

Source: Statistics Canada, Trucking in Canada, Catalogue No. 53-222, 1987.

1 Excludes subsidies.

2 Intra Nova Scotia traffic. Included in totals for both "to" and "from" traffic but should only be added once if "to" and "from" traffic are combined.

TABLE B-2

CN RAIL 1987 VOLUMES[1] AND REVENUES[2]

Origin/ Destination	TO NOVA SCOTIA Carload (Tonnes)	Container (TEU's)	Total Revenue ($)	FROM NOVA SCOTIA Carload (Tonnes)	Container (TEU's)	Total Revenue ($)
Newfoundland	Ø	608	177,000	Ø	18	13,000
Prince Edward Island	Ø	Ø	Ø	3,181	Ø	69,000
Nova Scotia	3,997,647	Ø	12,649,800	3,997,647	Ø	12,649,800
New Brunswick	73,091	367	1,678,000	198,991	24	2,746,700
Québec	220,818	58,068	26,413,000	256,130	47,942	25,473,000
Ontario	713,000	57,517	57,447,000	125,342	59,134	35,139,200
Manitoba	35,691	1,519	3,171,000	3,191	732	1,447,300
Saskatchewan	62,091	183	3,279,000	3,727	205	944,000
Alberta	136,182	873	7,041,000	8,509	1,214	4,125,000
British Columbia	99,918	1,226	18,388,000	8,600	1,186	5,431,800
Sub-total Canada:	5,338,438	120,361	130,243,800	4,605,318	110,455	88,038,800
U.S.	32,182	1,211	2,525,000	410,720	1,846	17,675,600
Grand Total:	5,370,620	121,572	132,768,800	5,016,038	112,301	105,714,400

GRAND TOTALS:

Tonnes	6,389,013	(Intra Nova Scotia counted only once)
TEU's	- 230,816	
Revenue ($)	225,833,400	(Intra Nova Scotia counted only once)

---

1 Excludes piggyback and Newfoundland Traffic.

2 Excludes subsidy payments.

Source: CN Rail

APPENDIX C

RESULTS OF SHIPPER SURVEY

RESULTS OF SHIPPER SURVEY

The shipper survey was designed to gain an accurate portrayal of traffic movements to, from, and within Nova Scotia. The transportation modes used, and the reason for their use, were investigated to determine the relative importance of each mode. A major goal of the survey was to determine the role played by the rail mode, and the thoughts of shippers concerning rail's importance in the future.

SAMPLE DEVELOPMENT

The shipper survey covered a cross-section of Nova Scotia's businesses, both large and small. In developing the sample, attention was paid to the size of the company, its industry, and its geographic location. We were able to reach most of Nova Scotia's major shippers and large companies. These companies are fairly few in number but are chiefly responsible for the economic health of rail service in the province. In addition, we contacted a number of smaller shippers for their views. Individually the small shippers may be of minor importance to the future of local rail service, but collectively they can be an important factor.

Attention was paid to the industry each shipper represented, to ensure the concerns of all major industry groups were heard. Shippers were classified into eight industry groups, as follows:

Industry Group	Number of Shippers Contacted
Automobiles	3
Building materials	10
Grain	4
Liquid bulk	7
Pulp and paper	4
Resources	4
Retail/distribution	4
Steel/engineering	3
Total:	39

EXHIBIT C-1

LIST OF SHIPPER SURVEY RESPONDENTS BY INDUSTRY GROUP

Industry Group	Company Name	CN Rail Sub.	ADI Respondent
Automobiles	Volvo	Bedford	*
	Autoport	Dartmouth	
	Michelin Tires Ltd.	Oxford/Chester	*
Building Materials	Lafarge Canada	Bedford	*
	Piercey's	Bedford	
	St. Lawrence Cement	Bedford	*
	Canexel	Chester	
	CIL	Chester	
	Canfor Building Mat.	Dartmouth	*
	Daigle Lumber	Dartmouth	*
	MacMillan Bloedel	Dartmouth	*
	Domtar Chemicals Group	Springhill	
	Co-Op Building Supplies	Sydney	
Grain	Dover Mills	Bedford	
	W. A. Flemming Ltd.	Bedford	*
	Canada Packers Inc.	Springhill	*
	Co-Op Atlantic	Springhill	*
Liquid Bulk	Speedy Propane	Bedford	
	Canadian Liquid	Dartmouth	
	Imperial Oil Ltd.	Dartmouth	*
	Liquid Carbonic Inc.	Dartmouth	*
	Superior Propane	Dartmouth	
	Texaco	Dartmouth	*
	Canso Chemicals Ltd.	Oxford	*
Pulp & Paper	Bowater Mersey	Chester	*
	Scott Maritimes Ltd.	Oxford	*
	J. D. Irving	Springhill	
	Stora Forest Ind.	Sydney	*
Resources	National Gypsum	Bedford	*
	Canadian Salt Co. Ltd.	Oxford	*
	Devco	Sydney	*
	Georgia-Pacific Corp.	Sydney	*
Retail/Distribution	Hudson's Bay Co.	Bedford	*
	Olands Breweries	Bedford	*
	Sears Canada Inc.	Bedford	*
	Sobey's Inc.	Hopewell	*
Steel	Hawker Siddely	Hopewell	
	Robb Engineering	Springhill	*
	Sydney Steel Corp.	Sydney	*

Exhibit C-1, **opposite**, presents a detailed list of participating shippers organized by industry group.

Because the main focus of this study was on shippers located on CN's Nova Scotia subdivisions, all shippers contacted were located on or close to CN's rail lines. The following table shows the breakdown of our sample by subdivision.

CN Subdivision	Number of Shippers
Bedford	11
Chester	3
Dartmouth	9
Hopewell	2
Oxford	4
Springhill	5
Sydney	5
Total:	39

Exhibit C-2, **overleaf**, presents a detailed list of survey respondents organized by subdivision.

The populous Halifax/Dartmouth area accounted for most shippers surveyed. Shippers of large volumes were also located on other subdivisions, however.

METHODOLOGY

The questionnaire was mailed with a covering letter to all companies in our sample. Companies were not requested to fill out the questionnaire although some chose to do so.

In most cases, Peat Marwick conducted the interview by telephone, with the questionnaire serving as a guide for the respondent. Our success rate was high, as the issue of rail versus road is an important issue for many companies. After consulting with CN, we believe that those shippers who were non-responsive were not major users of rail service. A copy of the

EXHIBIT C-2

LIST OF SHIPPER SURVEY RESPONDENTS BY CN SUBDIVISION

CN Rail Subdivision	Company Name	Industry Group	ADI Respondent
Bedford	Volvo	Automobiles	*
	Lafarge Canada	Building Materials	*
	Piercey's	Building Materials	
	St. Lawrence Cement	Building Materials	*
	Dover Mills	Grain	
	W. A. Flemming Ltd.	Grain	*
	Speedy Propane	Liquid Bulk	
	National Gypsum	Resources	*
	Hudson's Bay Co.	Retail/Distribution	*
	Olands Breweries	Retail/Distribution	*
	Sears Canada Inc.	Retail/Distribution	*
Chester	Canexel	Building Materials	
	CIL	Building Materials	
	Bowater Mersey	Pulp & Paper	*
Dartmouth	Autoport	Automobiles	
	Canfor Building Mat.	Building Materials	*
	Daigle Lumber	Building Materials	*
	MacMillan Bloedel	Building Materials	*
	Canadian Liquid	Liquid Bulk	
	Imperial Oil Ltd.	Liquid Bulk	*
	Liquid Carbonic Inc.	Liquid Bulk	*
	Superior Propane	Liquid Bulk	
	Texaco	Liquid Bulk	*
Hopewell	Sobey's Inc.	Retail/Distribution	*
	Hawker Siddely	Steel	
Oxford	Canso Chemicals Ltd.	Liquid Bulk	*
	Scott Maritimes Ltd.	Pulp & Paper	*
	Canadian Salt Co. Ltd.	Resources	*
	Michelin Tires Ltd.	Automobiles	*
Springhill	Domtar Chemicals Group	Building Materials	
	Canada Packers Inc.	Grain	*
	Co-Op Atlantic	Grain	*
	J. D. Irving	Pulp & Paper	
	Robb Engineering	Steel	*
Sydney	Co-Op Building Supplies	Building Materials	
	Stora Forest Ind.	Pulp & Paper	*
	Devco	Resources	*
	Georgia-Pacific Corp.	Resources	*
	Sydney Steel Corp.	Steel	*

questionnaire is included as Annex 1 to this Appendix. Annex 2 presents a detailed list of companies responding to the questionnaire, including contact persons and addresses.

RESULTS

The remainder of this appendix describes the results of the shipper survey. The questions are discussed in their order of appearance in the questionnaire. (Question 1 is omitted here, as it dealt with the companies' names, addresses, and similar data.)

Question 2(a) — Present Shipping Requirements

This question was used to develop a database of the types of commodities being shipped, their mode of transport, and the annual volume. Transportation rates were also requested (on a confidential basis) as an aid in the analysis of prototype movements.

In most cases, shippers were asked to supply their 1988 volumes and modes, as a proxy for 1989. However, in several cases 1988 did not resemble the case for 1989 and the near future. In those cases, shippers were instead asked to estimate the situation from 1989 onwards. Companies involved in the transportation of export flour at At & East rates, for example, expected to ship much lower volumes following the Canadian government's announcement of the elimination of that transportation subsidy.

Intra-provincial freight movements appear only once in the statistics, either as originating or terminating traffic, depending on the point of view of the company interviewed.

For example, a wood pulp producer might receive logs from within a radius of 100 miles. The move would be counted once, as traffic terminating a the producer's plant.

Exhibits C-3 through C-6, **overleaf**, present the volumes from Peat Marwick's survey, organized by mode, by industry, and by subdivision.

Volumes by Industry

Three industry groups account for 85% of the volume being shipped — resources, pulp and paper, and liquid bulk. The resources industry (coal, gypsum, and salt) are the main users of rail, making up close to 75% of the total rail volume. The survey identified two threats to this backbone of provincial rail traffic. Coal shipments from the Sydney area to Trenton and possibly Point Tupper may decrease dramatically when the Westray coal mine at Pictou comes

EXHIBIT C-3

PEAT MARWICK SURVEY OF NOVA SCOTIA SHIPPERS (1989)

Tonnes

Annual Volumes - Inbound

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	70,481	11,843	0	12,000	94,324
Building Mat.	134,807	141,426	0	23,000	299,233
Grain	63,230	22,350	61,130	64,000	210,710
Liquid Bulk	65,455	22,545	0	938,000	1,026,000
Resources	0	2,200	0	0	2,200
Retail/Dist'n	90,795	6,193	0	58,500	155,489
Steel	124,130	16,536	0	0	140,665
Pulp & Paper	54,335	2,718,723	0	29,100	2,802,158
Total	603,232	2,941,816	61,130	1,124,600	4,730,778

Annual Volumes - Outbound

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	12,000	100,000	0	0	112,000
Building Mat.	124,979	493,193	0	300	618,472
Grain	9,000	217,074	0	0	226,074
Liquid Bulk	126,195	1,502,287	0	465,000	2,093,482
Resources	4,079,000	579,000	0	400,000	5,058,000
Retail/Dist'n	54,500	86,900	0	0	141,400
Steel	119,294	35,897	0	0	155,191
Pulp & Paper	354,826	84,661	0	434,465	873,952
Total	4,879,794	3,099,012	0	1,299,765	9,278,571

Annual Volumes - Total

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	82,481	111,843	0	12,000	206,324
Building Mat.	259,786	634,619	0	23,300	917,704
Grain	72,230	239,424	61,130	64,000	436,784
Liquid Bulk	191,650	1,524,832	0	1,403,000	3,119,482
Resources	4,079,000	581,200	0	400,000	5,060,200
Retail/Dist'n	145,295	93,093	0	58,500	296,889
Steel	243,424	52,433	0	0	295,856
Pulp & Paper	409,161	2,803,384	0	463,565	3,676,110
Total	5,483,027	6,040,828	61,130	2,424,365	14,009,349

Note: Rail volumes include carload traffic only.

EXHIBIT C-4

PEAT MARWICK SURVEY OF NOVA SCOTIA SHIPPERS (1989)

Tonnes

Annual Volumes - Inbound

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	75%	13%	0%	13%	100%
Building Mat.	45%	47%	0%	8%	100%
Grain	30%	11%	29%	30%	100%
Liquid Bulk	6%	2%	0%	91%	100%
Resources	0%	100%	0%	0%	100%
Retail/Dist'n	58%	4%	0%	38%	100%
Steel	88%	12%	0%	0%	100%
Pulp & Paper	2%	97%	0%	1%	100%
Total	13%	62%	1%	24%	100%

Annual Volumes - Outbound

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	11%	89%	0%	0%	100%
Building Mat.	20%	80%	0%	0%	100%
Grain	4%	96%	0%	0%	100%
Liquid Bulk	6%	72%	0%	22%	100%
Resources	81%	11%	0%	8%	100%
Retail/Dist'n	39%	61%	0%	0%	100%
Steel	77%	23%	0%	0%	100%
Pulp & Paper	41%	10%	0%	50%	100%
Total	53%	33%	0%	14%	100%

Annual Volumes - Total

Industry	Rail	Truck	Rail/Truck	Marine	Total
Automobiles	40%	54%	0%	6%	100%
Building Mat.	28%	69%	0%	3%	100%
Grain	17%	55%	14%	15%	100%
Liquid Bulk	6%	49%	0%	45%	100%
Resources	81%	11%	0%	8%	100%
Retail/Dist'n	49%	31%	0%	20%	100%
Steel	82%	18%	0%	0%	100%
Pulp & Paper	11%	76%	0%	13%	100%
Total	39%	43%	0%	17%	100%

Note: Rail volumes include carload traffic only.

EXHIBIT C-5

PEAT MARWICK SURVEY OF NOVA SCOTIA SHIPPERS (1989)

Tonnes

Annual Volumes - Inbound

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	74,795	78,248	0	87,000	240,044
Chester	77,188	696,919	0	11,500	785,607
Dartmouth	176,155	16,990	0	996,500	1,189,645
Hopewell	49,215	4,536	0	0	53,750
Oxford	48,735	1,014,273	0	0	1,063,008
Springhill	72,230	29,350	61,130	12,000	174,710
Sydney	104,915	1,101,500	0	17,600	1,224,015
Total	603,232	2,941,816	61,130	1,124,600	4,730,778

Annual Volumes - Outbound

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	3,137,255	437,800	0	0	3,575,055
Chester	55,979	206,354	0	143,565	405,898
Dartmouth	142,830	1,631,487	0	465,000	2,239,317
Hopewell	68,039	3,629	0	0	71,667
Oxford	109,760	61,000	0	565,200	735,960
Springhill	130,676	270,774	0	0	401,450
Sydney	1,235,256	487,968	0	126,000	1,849,224
Total	4,879,794	3,099,012	0	1,299,765	9,278,571

Annual Volumes - Total

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	3,212,050	516,048	0	87,000	3,815,099
Chester	133,167	903,273	0	155,065	1,191,504
Dartmouth	318,985	1,648,477	0	1,461,500	3,428,962
Hopewell	117,253	8,165	0	0	125,418
Oxford	158,495	1,075,273	0	565,200	1,798,968
Springhill	202,906	300,124	61,130	12,000	576,160
Sydney	1,340,171	1,589,468	0	143,600	3,073,239
Total	5,483,027	6,040,828	61,130	2,424,365	14,009,349

Note: Rail volumes include carload traffic only.

EXHIBIT C-6

PEAT MARWICK SURVEY OF NOVA SCOTIA SHIPPERS (1989)

Tonnes

Annual Volumes - Inbound

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	31%	33%	0%	36%	100%
Chester	10%	89%	0%	1%	100%
Dartmouth	15%	1%	0%	84%	100%
Hopewell	92%	8%	0%	0%	100%
Oxford	5%	95%	0%	0%	100%
Springhill	41%	17%	35%	7%	100%
Sydney	9%	90%	0%	1%	100%
Total	13%	62%	1%	24%	100%

Annual Volumes - Outbound

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	88%	12%	0%	0%	100%
Chester	14%	51%	0%	35%	100%
Dartmouth	6%	73%	0%	21%	100%
Hopewell	95%	5%	0%	0%	100%
Oxford	15%	8%	0%	77%	100%
Springhill	33%	67%	0%	0%	100%
Sydney	67%	26%	0%	7%	100%
Total	53%	33%	0%	14%	100%

Annual Volumes - Total

Subdivision	Rail	Truck	Rail/Truck	Marine	Total
Bedford	84%	14%	0%	2%	100%
Chester	11%	76%	0%	13%	100%
Dartmouth	9%	48%	0%	43%	100%
Hopewell	93%	7%	0%	0%	100%
Oxford	9%	60%	0%	31%	100%
Springhill	35%	52%	11%	2%	100%
Sydney	44%	52%	0%	5%	100%
Total	39%	43%	0%	17%	100%

Note: Rail volumes include carload traffic only.

on stream in the near future. The Pictou mine is located closer to the Nova Scotia Power Corporation plant at Trenton, and may have a delivered cost advantage at Point Tupper.

The second threat concerns a gypsum move on the Sydney subdivision. Higher grade gypsum is expected to be depleted within five years at a Cape Breton mine, and no decision has been reached on whether to mine lower grade gypsum at that site. A potential scenario would be to close the mine, a move which would adversely affect the railway's viability.

Volumes by Subdivision

The Bedford, Sydney, and Dartmouth subdivisions account for most of the freight movement in Nova Scotia. Most of the Bedford traffic is accounted for by a large gypsum move by rail from Milford. The balance of the remainder tends to be truck movements from central supply locations in the Halifax area to customers located around the province.

On the Sydney subdivision, the majority of outbound traffic moves by rail, while 90% of inbound traffic is by truck. The rail moves are predominantly resource and pulp & paper shipments, while inbound truck movements supply all industry groups.

Aside from inbound and outbound marine shipments ascribed to the Dartmouth subdivision, the large majority of shipments are outbound truck shipments of liquid bulk products to customers across Nova Scotia.

Volumes by Mode

Total volumes shipped by rail and truck in Nova Scotia are evenly balanced. Relatively few shippers of bulk products account for most of the rail traffic, while traffic over the road is more evenly spread across all industries.

Peat Marwick's survey uncovered little in the way of intermodal traffic. For the purpose of this survey, an intermodal move was defined as taking place within Nova Scotia. Piggyback shipments off-loaded at Moncton for over-the-road movement into Nova Scotia were captured as truck traffic in the survey. In addition, importers of containers through Halifax were not included in the survey, as it was already understood that rail was vital to their operations.

EXHIBIT C-7

PROFILE OF CARLOAD RAIL TRAFFIC IN NOVA SCOTIA (TONS)

	Originating		Terminating	
Subdivision	Peat Marwick Shipper Survey 1989	CN Data 1987	Peat Marwick Shipper Survey 1989	CN Data 1987
Bedford	3,458,250	3,450,000	100,311	900,000
Chester	61,707	65,000	31,062	45,000
Dartmouth	157,444	250,000	3,501,130	3,560,000
Hopewell	75,001	5,000	385,811	360,000
Oxford	107,787	425,000	40,149	55,000
Springhill	122,000	95,000	100,928	70,000
Sydney	1,361,644	1,220,000	191,886	140,000
Nova Scotia Total:	5,343,831	5,510,000	4,351,276	5,130,000

Excludes all piggyback, all container, and all Newfoundland traffic.

Originating traffic includes all traffic originating on the subdivision.

Terminating traffic excludes all intra—subdivision traffic.

Comparison of Shipper Survey with CN Data

Canadian National supplied the consultants with 1987 volumes of carload traffic (excluding intermodal traffic) originating and terminating on each Nova Scotia subdivision. Exhibit C-7, opposite, compares Peat Marwick's survey data with volumes moved by CN.[1] In general, Peat Marwick's survey captured most or all of CN's originating traffic, with the exception of the Dartmouth and Oxford subdivisions. (Scott Maritimes, located on the Oxford sub, is now moving most of their outbound bleached pulp by barge rather than by rail, accounting for a large part of the Oxford discrepancy.)

Peat Marwick's survey also captured most or all of the terminating volumes moved by CN. Shippers surveyed were asked to estimate their traffic requirements in a "post-At & East" environment, which largely accounted for the discrepancy on the Bedford subdivision.

Question 2(b) — Annual Transportation Bill

This question was intended to determine private — sector spending on transportation by Nova Scotia companies, and the financial importance of transportation. Too many respondents did not know, or were unwilling to divulge, their spending on transportation. The response to Question 2(b) was considered invalid.

Question 2(c) — Modal Breakdown of Transportation Bill

The result to this question was not considered representative of transportation spending in the province, for the same reasons as noted above.

Question 2(d) — Common Carrier versus Private Fleet

Thirty-three respondents shipping by truck answered this question, with the following breakdown:

Common Carrier Only	Private Fleet Only	Combination of Private and Common
20	2	11
61%	7%	33%

[1] To conform with CN's methodology, Peat Marwick's data was modified to count intra-provincial moves as both originating and terminating traffic.

Question 2(e) — Transportation Problems

Problems mentioned by shippers are shown below, grouped into rail-related problems and other problems. Twenty respondents mentioned difficulties (some respondents gave more than one problem); an almost equal number of respondents had not encountered problems with transportation services.

	RAIL-RELATED	Number of Respondents who Mentioned Problems
1.	Slow rail service	6
2.	Rail car shortages	4
3.	High rail rates	2
4.	Poor rail service in general	2
5.	Distance from rail line to warehouse	1
6.	Weight restrictions	1
7.	Sidings being dismantled	1
OTHER		
8.	Product damage/loss while in transit	3
9.	Low frequency of marine carrier service to Halifax	1
10.	Problems after Route Canada's demise	1
11.	Port restrictions on dangerous goods	1
12.	Weather delays for marine shipments	1

Question 2(f, g) — Control of Modes/Payment of Transportation Bill

These questions were intended to ensure an adequate number of transportation decision-makers were contracted. Ten respondents stated that they either did not select the modes used, or did not directly pay for the freight movements. In most of these cases, though, transport decisions were made elsewhere within the company (e.g., Toronto, Montreal) with consistent company-wide views on the issue of rail versus road.

Question 3 — Reasons for Selection of Rail and Truck

Not surprisingly, cost was the main factor in choosing rail or truck use. The second most important criterion for choosing rail was the "Other" category, showing rail's usefulness in transporting dangerous goods and commodities requiring special handling. The results for truck confirm that mode's role in quickly supplying customer orders in the province and the Maritimes region.

Reasons for Rail Selection

Cost	Volume	Speed	Availability	Other*
35	12	10	9	16

* "Other" reasons included:
- Special handling/packaging characteristics
- Dangerous goods
- Source of back up inventory
- Distance of travel
- Excellent service
- Loyalty to the railway
- Rail unloading facility in place

Reasons for Truck Selection

Cost	Volume	Speed	Availability	Other*
20	5	20	19	11

* "Other" reasons included:
- Only practical alternative is truck
- Flexibility
- Reliability
- Special handling/packaging characteristics

Question 4(a) — Importance of Direct Rail Service

Forty-six percent of respondents rated direct rail service as indispensable to their businesses. A full ninety percent of shippers rated rail as "important", "highly important", or "indispensable".

Those industries with the highest dependence on rail were building materials (70% replied "indispensable"), grain, automobiles, and steel. Surprisingly, resource — sector respondents were less outspoken about the importance of rail, perhaps taking for granted its continued existence.

The importance of rail was rated highest on the Sydney subdivision, where 80% of respondents rated it indispensable. Shippers on the Bedford and Dartmouth subdivisions also rated highly the importance of rail service.

Importance of Direct Rail Service

Industry	Not Important	Some Importance	Important	Highly Important	Indispensable	Total
Automobiles	0	0	0	1	1	2
Building Materials	0	0	2	1	7	10
Grain	0	0	1	0	3	4
Liquid Bulk	1	1	0	3	2	7
Resources	0	0	2	1	1	4
Retail/Distribution	1	1	1	1	1	5
Steel	0	0	0	1	2	3
Pulp & Paper	0	0	3	0	1	4
Total:	2	2	9	8	18	39

Importance of Direct Rail Service

Subdivision	Not Important	Some Importance	Important	Highly Important	Indispensable	Total
Bedford	0	1	1	5	4	11
Chester	0	0	3	0	1	4
Dartmouth	1	1	0	1	6	9
Hopewell	1	0	0	0	1	2
Oxford	0	0	2	1	0	3
Springhill	0	0	2	1	2	5
Sydney	0	0	1	0	4	5
Total:	2	2	9	8	18	39

Question 4(b) — Reasons for Ranking Importance of Rail

This question asked shippers to explain why they gave a particular ranking to the importance of direct rail service. The overwhelming reason for rating rail service highly was the economics afforded by the superior volume of rail boxcars, vis-à-vis trucks ("truck capacity too small"), and rail's advantages over long distances (particularly for importing lumber and building materials from the West Coast).

Other reasons mentioned more than once were: to maintain a competitive rate structure (rail versus marine), greater safety in shipping by rail rather than road (chemicals), and shipping products which cannot move over the road (railcars and 78-foot rails). In addition, ten other reasons were mentioned once by respondents.

Question 4(c) — Commodities That Can Only Move by Rail

The following commodities were mentioned as suitable only for rail transportation:

Butane

Wheat (from company-owned elevators)

Canola meal (Minimum Compensatory Rates)

Gypsum (mine site captive to rail)

Chlorine

Steel (60-foot and 78-foot sections)

Preservatives

Liquid sulphur

Railway ties (by customer request)

In addition, five respondents replied that from an operations standpoint, there existed alternatives to rail; financially, however, no other mode was practical but rail.

Question 4(d) — Adjustments Required Without Direct Rail Service

Six respondents replied that loading or unloading arrangements would have to be modified, in some cases to a great extent. An equal number could switch to motor carriers without changing their operations, but their transportation costs would increase.

Four respondents said losing rail service would or might cause them to shut down their entire plant, while a further three companies would scale back their operations and reduce the number of employees. Three shippers would switch from using rail to using marine carriers, while two would offer different products for sale if rail service was terminated.

Question 5 — Effect of the Elimination of Subsidies

Aside from increased transportation costs, the elimination of subsidies for rail and truck transportation would not have an effect on the choice of mode and method of serving markets.

Questions 6(a, b), Past and Future Changes in Transportation

Sixteen respondents have recently made or will make modal changes, as described below. In general the comments reflect a shift away from the rail mode, with a few exceptions.

MODAL CHANGE	Number of Respondents who Mentioned Change
More use of truck, less use of rail	5
More use of piggyback, less use of boxcar	3
Decrease or termination of marine moves	2
More use of rail, including pool shipments	2
Stopped use of piggyback	1
Switch from rail to marine	1
Containers/trucks to Newfoundland instead of rail	1
Increase use of barges	1
Total responses:	16

Question 6(c). — Change in the Use of Rail in Next Ten Years

Seventy-one percent of shippers expect no change in their use of rail over the next decade. Only thirteen percent expect to see their rail use increase in the same time frame, as shown in the tables below.

	FUTURE USE OF RAIL SERVICES			
Industry	**Increase**	**Decrease**	**No Change**	**Total**
Automobiles	1	0	1	2
Building Materials	2	1	7	10
Grain	0	1	3	4
Liquid Bulk	1	0	5	6
Resources	0	1	3	4
Retail/Distribution	0	1	4	5
Steel	0	1	2	3
Pulp & Paper	1	1	2	4
Total:	5	6	27	38

Subdivision	FUTURE USE OF RAIL SERVICES Increase	Decrease	No Change	Total
Bedford	1	2	8	11
Chester	1	0	3	4
Dartmouth	0	0	8	8
Hopewell	0	1	1	2
Oxford	1	1	1	3
Springhill	2	1	2	5
Sydney	0	1	4	5
Total:	5	6	27	38

Question 7 — Comments on Deregulation, Free Trade, and Vehicle Weights and Dimensions

The effects from these three areas are listed below in point form.

Transportation Deregulation

- Are seeing a "shake-out", concentration in Maritime trucking industry. Anticipating significant rate increases.
- Positive effect in the short-term, particularly in rail rates. Predict industry consolidation and rate increases in longer term.
- Has destabilized trucking industry in Maritimes, placed carriers in difficulty. Will soon see only two big carriers. Rates will be increasing significantly by 1990.
- Trucking services have improved, some new options have been provided.
- Deregulation has resulted in some shift from use of rail to use of trucks.
- Further rail line abandonment will lead to switch away from rail.

Comments on Free Trade

- Positive impact, as price of US products has decreased.
- Positive impact, as U.S. parent company can sell more competitively back to Canada.
- Positive impact, plan to sell to northeastern United States.
- Negative impact, could go out of business if government subsidies must be withdrawn.
- Negative impact, could cause difficulties if government subsidies are not allowed.
- Negative impact, volumes could decrease significantly.
- Negative impact, as U.S. suppliers will take larger share of Canadian market.

Comments on Increased Vehicle Weights and Dimensions

- Could result in some diversion from rail to truck (8 respondents).
- Should improve total loading time as fewer trucks are necessary.
- Help to hold down or decrease rail rates.
- Highway improvement is more important than increased vehicle weights and dimensions.
- Decrease in truck rates of about 5% not significant enough to cause modal shift.
- Should lower truck rates.

Questions 8(a, b, c) — Comments on Government Policies and Initiatives

The number of respondents making similar comments is indicated in parentheses.

- Twin the Trans-Canada Highway throughout Nova Scotia and especially New Brunswick (9).
- Improve highway quality to allow increased vehicle weights (5).
- Satisfied with government transportation policies (5).
- Against government transportation subsidies, as they are too easily manipulated (i.e., reduced) (4).

- In favour of transportation subsides, as they are important to business success in the Maritimes (4).
- Pressure CN to improve its service and commitment to the Maritimes (4).
- Make vehicle weights and dimensions consistent across all provinces (3).
- Introduce toll highways as a "user-pay" system (2).
- Allow larger vehicle weights and dimensions in Nova Scotia (2).
- Avoid gasoline surtaxes, as it is not an equitable "user-pay" system (2).
- Eliminate Canadian flag requirement for domestic marine moves (2).

ANNEX 1

QUESTIONNAIRE

Rail vs. Road: Freight Alternatives into the 21st Century

(1). Company Information

Company Name: _____

Address: _____ _____

_____

Telephone No.: _____

Contact: _____

Position: _____

S.I.C. Code (To be completed by PMCG): _____

Type of operation:

Manufacturer	___
Wholesaler	___
Retailer/Distributor	___

CONFIDENTIAL WHEN COMPLETED

Results will be aggregated with all other interviews for summary purposes.

2(a) Please indicate your present shipping requirements for both inbound and outbound freight.

Record only those commodity movements that originate or terminate in Nova Scotia.

Inbound shipments to plant

Movement ID#	Commodity	From	To	Mode of Transport (*)	1988 volume (metric tonnes)	# of carloads/ truckloads/ containers	Price/rate per unit	Confidential contract (y/n)

Outbound shipments from plant

Movement ID#	Commodity	From	To	Mode of Transport (*)	1988 volume (metric tonnes)	# of carloads/ truckloads/ containers	Price/rate per unit	Confidential contract (y/n)

Please ensure that each plant site in the province is considered separately.

When the same commodity moves between two points by more than one mode, please list each mode separately.

(*) Indicate one of the following: rail car, truck, piggyback, water, other

2(b) What is your company's total annual transportation bill?

2(c) What is the % breakdown of your company's annual transportation bill:

Rail (Carload/Piggyback/Container) ____

Truck ____

Water ____

Other (specify) ____

100%

2(d) For truck shipments noted, do you use only common carrier?

Yes ____

No. Indicate % of shipments by private fleet. ____

2(e) What problems have you encountered with transportation services for any of the commodity movements noted?

No problems ____

Otherwise, specify. _____

_____

2(f) Are you responsible for paying the freight bills for the movements listed in 2(a)?

No ____

Yes. Specify ID#. _____

_____

2(g) Do you have control over the selection of the modes of transportation listed in 2(a)?

Yes. Specify ID#. ____ _____

_____

No ____

If no, explain why. _____

_____

3. Please indicate the reasons for using the current modes of transportation. Check all that apply for each commodity/mode of transport combination (*).

Inbound shipments to plant

Movement ID#	Cost	Volume	Speed of delivery	Availability	Special packaging characteristics (please specify)	Special handling characteristics (please specify)	Dangerous goods	Other (specify)

Outbound shipments from plant

Movement ID#	Cost	Volume	Speed of delivery	Availability	Special packaging characteristics (please specify)	Special handling characteristics (please specify)	Dangerous goods	Other (specify)

(*) Please circle the most important factor for each movement.

4(a) Please rate the importance of direct rail service to your company's operation:

Not important ____

Of some importance ____

Important ____

Highly important ____

Indispensable ____

4(b) Why?

_____

_____

_____

_____

_____

4(c) Do you have any commodity that can only move by rail?

No ____

Yes. Explain. _____

_____

_____

_____

4(d) What adjustments in your operations would be required if direct rail service was no longer available?

_____

_____

_____

_____

5. What effect would the elimination of subsidies for rail/truck transportation have on your choice of mode and method of serving markets?

_____

_____

_____

6(a) Has your company made any significant changes during the past five years in its transportation requirements? If yes, please describe the changes made and the reasons why.

Change in volume _____

_____

_____

Change in mode _____

_____

_____

Change in markets _____

_____

_____

6(b) Do you anticipate making changes in the next ten years in your company's transportation requirements? If yes, please describe the changes to be made and the reasons why.

Change in volume _____

_____

_____

Change in mode _____

_____

_____

Change in markets _____

_____

_____

6(c) In particular, do you foresee any change in the use of the rail mode in the next ten years? If yes, please describe the change and the reasons behind it.

_____

_____

7. What effect, if any, will the following have on your operations:

Transportation deregulation including NTA 1987.	Volumes	_____
	Destinations	_____
	Modes	_____
Free trade	Volumes	_____
	Destinations	_____
	Modes	_____
Increased vehicle weights and dimensions	Volumes	_____
	Destinations	_____
	Modes	_____

8(a) What are your general comments regarding existing government transportation policies of the Government of Canada?

8(b) What are your general comments regarding existing government transportation policies of the Province of Nova Scotia?

8(c) What provincial government initiatives could be undertaken to improve the existing transportation system in Nova Scotia?

ANNEX 2

DETAILED LIST OF COMPANIES RESPONDING TO SURVEY

ANNEX 2

DETAILED LIST OF SURVEY RESPONDENTS

Mr. J. McKenna
Materials Manager
Volvo Canada Ltd.
P.O. Box 2027
Halifax, Nova Scotia
B3J 2Z1

Mr. Hugh McManus
General Manager
Autoport
P.O. Box 9
Eastern Passage, Nova Scotia
B3G 1M4

Mr. Charlie Connors
Traffic Manager
Michelin Tires Canada Ltd.
P.O. Box 399
New Glasgow, Nova Scotia
B2H 5E6

Mr. G.M. Langford
Plant Manager
Lafarge Canada
P.O; Box 5
Brookfield, Nova Scotia
B0N 1C0

Mr. Brian Knight
Distribution Coordinator
Canweld Building Materials
120 Isley Avenue
Dartmouth, Nova Scotia
B3B 1S7

Mr. B.J. Noble
Manager
Daigle Lumber
15 Fielding Avenue
Dartmouth, Nova Scotia
B3B 1C9

Mr. Jim McCullough
General Manager
Piercey's
2854 Robie Street
Halifax, Nova Scotia
B3K 5M6

Mr. T.D. Black
Terminal Manager
St.Lawrence Cement Inc.
P.O. Box 666
Bedford, Nova Scotia
B4A 3H4

Mr. G.H. Cook
Shipping Coordinator
Canexel
East River Mill
Chester, Nova Scotia
B0J 1J0

Mr. Lewis Gregg
Transportation Specialist
C.I.L.
P.O. Box 200, Station A
North York, Ontario
M2N 6H2

Mr. Robert Samson
Office Supervisor
Co-Op Building Supplies
P.O. Box 370
Sydney, Nova Scotia
B1P 6H3

Mr. John Doering
Vice-President, General Manager
Dover Mills
P.O. Box 2185
Halifax, Nova Scotia
B3J 3C4

Mr. George Cameron
Sales Supervisor
MacMillan Bloedel
29 Gurholt Drive
Dartmouth, Nova Scotia
B3B 1J8

Mr. A. Angelini
Atlantic District Manager
Domtar Chemicals Group
P.O. Box 278
Truro, Nova Scotia
B2N 5C1

Mr. G.E. Johnson
Manager, Agricultural Services
Co-Op Atlantic
123 Halifax Street
Moncton, New Brunswick
E1C 8N5

Mr. Barrie Conrod
Office Manager
Speedy Propane
145 Main Street
Dartmouth, Nova Scotia
B3L 4K9

Mr. Rick Jones
Atlantic Regional Manager
Canadian Liquid Air
P.O. Box 1009
Dartmouth, Nova Scotia
B2Y 3Z7

Mr. John Merrylees
Coordinator—Rail Operations
Imperial Oil Ltd.
P.O. Box 220
Halifax, Nova Scotia
B3J 2N6

Mr. Dave Chandler
District Manager
Bowater Mersey Paper Company
P.O. Box 1150
Liverpool, Nova Scotia
B0T 1K0

Mr. Gary Vaughan
General Manager
W.A. Flemming Ltd.
P.O. Box 277
Truro, Nova Scotia
B2N 5C1

Mr. Dale Tedford
Canada Packers Inc.
P.O. Box 1630
Summerside, Prince Edward Island
C1N 2V5

Mr. G.E. Elliot
Office Manager
Liquid Carbonic Inc.
40 Gurholt Drive
Dartmouth, Nova Scotia
B3B 1J9

Mr. Marvin Bezanson
Regional Manager
Superior Propane
R.R. #4, D15
Moncton, New Brunswick
E1C 8J8

Mr. F. Bevan
Plant Manager
Texaco Canada Inc.
P.O. Box 667
Dartmouth, Nova Scotia
B2Y 3Y9

Mr. Robert Wong
Accounting and Personnel Supervisor
Canso Chemicals Limited
P.O. Box 484
New Glasgow, Nova Scotia
B2H 5E5

Mr. K.S. Farren
Office Manager
National Gypsum Canada Ltd.
P.O. Box 57
Milford, Nova Scotia
B0N 1Y0

Mr. Bob Tutty
Traffic Manager
Scott Maritimes Ltd.
P.O. Box 549 D
New Glasgow, Nova Scotia
B2H 5E8

Mr. Paul Orser
Woodlands Accounting
J.D. Irving Ltd.
P.O. Box 5777
Saint John, New Brunswick
E2L 4M3

Mr. John MacDonnell
Manager Transportation
Stora Forest Industries
P.O. Box 59
Port Hawkesbury, Nova Scotia
B0E 2V0

Mr. R.S. Gibbs
Supervisor, Shipping & Receiving
Hudson's Bay Company
7067 Chebucto Road
Halifax, Nova Scotia
B3L 4R5

Mr. Ross Jones
Logistics Manager
Olands Breweries
P.O. Box 8600, Station A
Halifax, Nova Scotia
B3K 5N4

Ms. Donna Mounteer
Manager, Distributiion
Sears Canada, Inc.
222 Jarvis Street
Toronto, Ontario
M5B 2B8

Mr. J.G. Fitzpatrick
Vice-President Distribution
Sobey's Inc.
115 King Street
Stellarton, Nova Scotia
B0K 1S0

Mr. Fraser MacLeod
Distribution Coordinator
Canadian Salt Co. Ltd.
P.O. Box 160
Pugwash, Nova Scotia
B0K 1L0

Mr. Bill MacLellan
General Manager—Railway
Cape Breton Development Corp.
P.O. Box 2500
Sydney, Nova Scotia
B1P 6K9

Mr. J. Graham
Plant Manager
Georgia—Pacific Corp.
P.O. Box 400
Port Hawkesbury, Nova Scotia
B0E 2V0

Mr. Gary Rood
Stores and Traffic Manager
Trenton Works Lavalin Inc.
P.O. Box 130
Trenton, Nova Scotia
B0K 1X0

Mr. R. Crossman
General Manager
Robb Engineering
P.O. Box 490
Amherst, Nova Scotia
B4H 4A3

Mr. Wayne Musgrave
Supervisor—Traffic and Customs
Sydney Steel Corp.
P.O. Box 1450
Sydney, Nova Scotia
B1P 6K5

APPENDIX D

CN RAIL PLANT

I. CN HALIFAX-MONCTON RAIL LINE

INTRODUCTION

Information on the condition of the CN Halifax-Moncton rail line was obtained by a track and roadway specialist by means of a trip made over the line in a CN rail-mounted inspection vehicle. The trip was made on March 7 and 8, 1988, and the specialist was accompanied by CN's Maintenance Engineer and the two Roadmasters directly responsible for maintenance of the track. Inasmuch as the significance of the condition of a track at any given time is to some considerable extent related to the type of track construction, the nature of the maintenance input, the speed and volume of the traffic and other factors, these data were also provided by CN and are presented below followed by comment on track conditions observed.

TRACK CONFIGURATION

The total route length between Halifax and Moncton is 188.9 miles, consisting of the 64.9-mile long Bedford Subdivision between Halifax and Truro and the 124.9-mile long Springhill Subdivision between Truro and Moncton. Both subdivisions are a mixture of single and double main track as follows;

Bedford Subdivision

Halifax (mile 0.0) to Windsor Junction (mile 15.8)	—	double track
Windsor Junction (mile 15.8) to Hyde (mile 61.5)	—	single track
Hyde (mile 61.5) to Truro (mile 64.0)	—	double track

Springhill Subdivision

Truro (mile 0.0) to Belmont (mil 7.7)	—	double track
Belmont (mile 7.7) to Painsec Junction (mile 117.5)	—	single track
Painsec Junction (mile 117.5) to Moncton (mile 124.9)	—	double track

TRACK STRUCTURE

Rail

Bedford Subdivision

Mile	0.0	to mile	15.6	—	100 lb. ([1]), CWR [2]
Mile	15.6	to mile	37.2	—	132 lb. CWR
Mile	37.2	to mile	61.5	—	115 lb. jointed [3]
Mile	61.5	to mile	64.0	—	100 lb. jointed

Springhill Subdivision

Mile	0.0	to mile	7.6	—	115 lb. CWR
Mile	7.6	to mile	116.6	—	132 lb. CWR
Mile	116.6	to mile	124.7	—	115 lb. CWR
Mile	124.7	to mile	124.9	—	100 lb. jointed

Note: On some of the curves in the jointed rail territory, the jointed rail has been replaced with CWR.

Ties

There are 3,110 hardwood ties per mile throughout the entire route.

Tie Plates

The track is fully tie plated with double shoulder tie plates throughout the entire route.

Ballast

Ballast is crushed rock throughout the entire route.

---

1 Explanation of terms referenced by bracketed numbers may be found at the end of this chapter (starting on Page VI-7).

TRACK MAINTENANCE

Day-to-day maintenance of the track is carried out by the permanent local track maintenance forces comprised of small gangs located at intervals along the track.

Large track rehabilitation programs are accomplished by seasonal specialized gangs equipped with high production machinery specifically intended for the type of work to be done. Generally, such gangs operate over the entire Atlantic region, but some cover a wider territory and some a smaller territory, depending on the type of work. Work carried out by these gangs includes rail renewal programs; tie replacement programs; ballasting programs; track undercutting programs; (4) and road crossing renewal programs.

Significant program work of these types have been carried out in recent years on the Halifax-Moncton line. On the Springhill Subdivision in 1987, for example, the then 100 lb. jointed rail on both tracks of the double track section between mile 0.0 (Truro) and mile 7.6 was replaced with new 115 lbs. CWR; the single track between mile 20 and mile 48 was undercut and new ballast installed and all defective ties replaced; and between miles 41.5 and 61.0 a number of turnouts and road crossings were similarly improved by undercutting, ballasting and tie renewals.

Planned track maintenance program work on the line for the 1988 work season includes:

- track undercutting, the addition of new ballast and replacement of defective ties between miles 7.7 and 20 on the Springhill Subdivision;
- defective tie replacements and track surfacing between miles 117 and 124 on the Springhill Subdivision;
- track surfacing between miles 88 and 117, Springhill Subdivision and miles 17 and 37 on the Bedford;
- undercutting and ballasting of various turnouts and road crossings on the Bedford Subdivision (limits of program not yet finalized);
- replacing of worn rail in various curves on both the Springhill and Bedford Subdivisions;
- continuation of ongoing culvert replacement program on both subdivisions;
- continuation of ongoing program on both subdivisions of replacement of bolted joints between 1/4 mile strings of CWR with field welds.

TRACK INSPECTIONS

Five types of track inspections are carried out as follows:

1. Inspection by a qualified track person, on a track motor car or hy-rail vehicle, three times weekly with not more than two calendar days between inspections. At least one inspection per week is made by the Roadmaster;
2. Inspection by a qualified track person on a train once every three weeks during summer conditions and once per week during winter conditions;
3. Walking inspection by a qualified track person once per year;
4. Operation of CN Test Car (5) over the track two or three times per year;
5. Inspection of rail by rail flaw detector car (6) twice per year.

HOT BOX AND DRAGGING EQUIPMENT DETECTORS (7)

To avoid train accidents caused by overheated freight car wheel bearings and/or dragging equipment, there are a total of six wayside inspection devices on the Halifax-Moncton route for the detection of such train defects. Two of these are on the Bedford Subdivision and four on the Springhill Subdivision.

TRAIN CONTROL SYSTEM

The Automatic Block Signal (ABS) system (8) for train control is employed on the double track portions of the route. On the single track portions, the Centralized Traffic Control (CTC) (9) system is employed.

TRAIN SPEEDS

Maximum permissible train speeds vary between portions of the route (zones) on the basis of type of train (rail liner, passenger, freight) and the track curvature and other conditions within each zone. Each zone is identified in the operating timetable by its mileage limits and the maximum permissible speed within that zone is stipulated. The range of maximum permissible speeds in mph currently in effect for the various zones within the two subdivisions on the Halifax/Truro line are shown below.

	Rail Liner	*Passenger*	*Freight*
Bedford Subdivision	80-25	75-25	60-25
Springhill Subdivision	70-30	70-30	60-30

Within some zones, further speed restrictions are in effect at specific locations such as certain public road crossings.

Train speeds in the ranges outlined above are typical of CN's principal main track across Canada.

ANNUAL GROSS TONNAGE ON THE ROUTE

During the year 1986, the latest full year for which figures were available, the annual gross tonnage (i.e., including locomotives and freight and passenger equipment) carried on the route was as follows:

Bedford Subdivision	—	varied between 11 and 16 million gross tons depending on location
Springhill Subdivision	—	approximately 14 million gross tons

Approximately 50% of these tonnages were carried on each track of the respective double track portions of the subdivisions.

TRACK CONDITION

In addition to observations made while travelling, closer inspection of the track was made from the ground at intervals throughout the route while obtaining train orders by radio from the dispatcher, waiting for passing trains and whenever conditions observed from the car indicated the desirability of stopping for a closer examination.

No unsafe track conditions were observed. Track line, particularly in the CWR territory, is good and no significant deviations in track surface and cross level were observed. The ballast section is very good; i.e., the ballast is crushed rock, the cribs (spaces between ties) are full and there is a substantial ballast shoulder beyond the ends of the ties. Generally, the tie condition is satisfactory. As is normal in all track, some ties are candidates for replacement

during the upcoming work season. Turnouts and public road crossings are in generally satisfactory condition.

A number of the public road crossings have been rebuilt in recent years utilizing prefabricated concrete, and full depth rubber or polyethylene slabs in lieu of the usual wood planking or asphalt. Rubber flangeways have been installed at a large number of other crossings. All of these improved crossings are in very good condition.

The numbers of rail anchors in CWR territory conform with requirements but at a few locations some are not tight against the tie. This is not an abnormal condition at this time of year (March), inasmuch as the snow which has covered the ties and anchors for the past several months and has precluded adjustment, has only just disappeared. As long as they are tightened before the onset of high ambient temperatures, the condition presents no hazard.

Overall, the track structure and its condition were found to be satisfactory for the traffic being handled and the permissible train speeds. Presuming continuance of the present quality of track through the necessary maintenance input and component renewal, there is no reason to expect significant operational problems attributable to track condition.

Explanation of Terms

(1) 100 lb. — Rail is usually described by its weight per yard. Thus 100 lb. rail means that it weighs 100 lb per yard, 115 lb. rail weighs 115 lb. per yard, etc. The strength of the rail varies directly with its weight. The heaviest (strongest) rail used on Canadian railways is 136 lbs.

(2) CWR — Abbreviation for "continuous welded rail". Until the 1960's all new rail was installed in track in the 39 ft. lengths received from the mills and the individual pieces connected together with bolts and splice bars. To eliminate the very significant maintenance input required to keep the adjoining ends of the rails in good vertical and horizontal alignment, most railways now weld the individual lengths together into continuous "strings" approximately one quarter mile in length, before

installation in track. To reduce welding costs some mills now roll the rail in 78 ft. lengths. More recently, the practice of welding the "strings" together after installation in track has become common, thereby further reducing the number of bolted joints.

(3) Jointed (track) — Track consisting of 39 or 78 ft. lengths of rail with bolted joints between each length; i.e, not welded.

(4) Undercutting — Removal of existing ballast from the track and replacement with new ballast. This becomes necessary when the existing ballast ceases to provide proper drainage because of pulverization of some of the ballast particles and the entry of earth into the ballast section from the subgrade or other sources. Undercutting is usually done by a contractor using large specialized equipment. The ballast removed is screened and the reusable material, which depending on conditions will vary from 10 to 15 percent, is replaced in the track. The finer material is wasted on the railway right-of-way. Sufficient new ballast to replace the wasted material is added to the track.

(5) CN Test Car — The car measures and records the actual track condition as it appears under dynamic loading using methods which are state-of-the-art in data acquisition, computer technology and integrated data processing. Because the measurements are made under a moving loaded vehicle, i.e., under dynamic loading, the data obtained are much superior to those obtained in the past using manual methods of measurement on unloaded track.

The CN Test Car is made up of a coach car equipped with computers and recording equipment and an instrumented box car, the weight of which can be

varied. The consist is pulled in a train and measures and records the following track parameters:

superelevation	cross level
curvature	surface profile
gauge	track twist

Five different condition reports are produced in real time on-board the car. These reports are utilized by various levels of maintenance personnel for immediate corrective action and short- and long-term maintenance planning.

(6) Rail Flaw Detector Car — Various types of rail defects are cause for removal from track to avoid actual failure of the rail under a train. Certain types can be, and are, detected visually during regular manual track inspection. Others are internal and their detection requires special equipment. On most North American railways including CN, inspection of the rail for internal defects is accomplished by a rail-mounted self-propelled rail flaw detector car in which the special induction and ultrasonic search equipment is housed. Such cars, including the necessary qualified technicians, are available to North American railways from a limited number of contractors on a cost-per-mile-of-testing basis and are utilized extensively.

(7) Hot Box and Dragging Equipment Detector — The purpose of these devices is to scan passing trains for overheated wheel bearings and dragging equipment such as brake beams, both of which can lead to a derailment. They are installed at 20 to 30-mile intervals depending on local conditions. The detection of overheated bearings is accomplished by heat-sensitive

transducers mounted on each side of the track and placed such that they will view the bearings as the train passes the site. These sensors produce an output that is proportional to the infra-red energy being emitted from the bearing being scanned.

For the detection of dragging equipment, a steel plate is mounted between the rails and connected electrically to the trackside equipment. An indicative signal is generated if the plate is struck by anything dragging from the underside of the train.

In both cases, the information is transmitted to the train crew. This may be done by transmission of the signal generated by the detector to a central office where it is interpreted by a skilled operator who in turn advises the train crew by radio. Alternatively the signal may be reported directly to the train crew — either by a wayside "scoreboard" displaying location (by axle count) of the suspect bearing or the dragging equipment, or by a voice synthesizer or "talker" reporting over the train radio. The train is brought to a stop, the defective condition located and appropriate action taken.

(8) ABS — Automatic Block Signal train control system. The basic objective of all train control systems is to ensure the safe and efficient movement of rail traffic from point of origin to destination. Prior to introduction of ABS, train control was exercised through written train orders authorized by a central dispatcher and delivered manually by the station agent to the crew of a train and giving exclusive possession of a specified segment or "block" of the route to a single train. The train order system or modifications of it, is still utilized on portions of Canadian railways where traffic is light.

Basically, ABS is an augmentation of the train order system. In ABS territory, the main line is divided into a series of consecutive blocks. Entry of a train into each block is governed by the aspect displayed by a fixed signal installation at the start of the block. These block signals are automatically controlled by the trains themselves. Presence or absence of a train in the block is determined by an electrical circuit known as a track circuit, which, utilizing the rails as conductors, controls the aspect displayed by the block signal.

(9) CTC — Centralized Traffic Control train control system. CTC is essentially a much sophisticated version of ABS. It is a system of train operation controlled from a central location. It places the control and operation of block signals and switches over an extended territory directly in the hands of the train dispatcher. CTC directs trains entirely by signal indication, operates siding switches and crossovers electrically and automatically informs the dispatcher by visual and audible indications of the location of all trains on the territory. Safety checking resides at trackside where specialized control circuitry, known as vital interlocking control, ensures the fail safety of the system by interconnecting the switches, signals and track circuits in order to prohibit conflicting commands and to prevent unsafe conditions.

II. CN TRURO-SYDNEY RAIL LINE

Information on the condition of the Truro-Sydney rail line was obtained in meetings with CN Rail track engineers. An independent inspection of the line was not conducted.

TRACK CONFIGURATION

The total length of the route between Truro and Sydney is 230.1 miles consisting of the Hopewell Subdivision (116.2 miles) between Truro and Havre Boucher and the Sydney Subdivision (113.9 miles) between Havre Boucher and Sydney. The entire route is single track, train order territory.

TRACK STRUCTURE

Rail

Based on materials supplied by CN Rail, the weight of rail is as follows:

Hopewell Subdivision

Mile	0.0	to mile	5.0	—	100-115 lb. jointed
Mile	5.0	to mile	25.6	—	115 lb. SWR, CWR
Mile	25.6	to mile	27.7	—	100 lb. jointed
Mile	27.8	to mile	37.2	—	100 lb./115 lb. jointed
Mile	37.2	to mile	62.4	—	115 lb. SWR, CWR
Mile	62.4	to mile	64.5	—	115 lb. jointed
Mile	64.5	to mile	86.0	—	115 lb. CWR, SWR
Mile	86.0	to mile	90.0	—	100 lb. jointed
Mile	90.0	to mile	116.2	—	115 lb. CWR/SWR

Sydney Subdivision

Mile	0.0	to mile	63.1	—	115 lb. CWR
Mile	63.1	to mile	63.8	—	115 lb. jointed
Mile	63.8	to mile	66.8	—	115 lb. CWR
Mile	66.8	to mile	66.9	—	115 lb. jointed
Mile	66.9	to mile	68.6	—	115 lb. CWR
Mile	68.6	to mile	69.0	—	115 lb. jointed
Mile	69.0	to mile	98.9	—	115 lb. CWR, SWR
Mile	98.9	to mile	99.0	—	115 lb. jointed
Mile	99.0	to mile	113.8	—	115 lb. CWR
Mile	113.8	to mile	113.9	—	115 lb. jointed

The year the track was laid for each mileage post was also provided.

Ties

There are 3,110 No. 2 hardwood ties/mile for the entire route. The ties are in pretty good shape. There have been tie programs in the past although none are planned for this year.

Tie Plates

The track is tie plated with double shoulder tie plates (both 11 inch and some 14 inch) along the entire route.

Ballast

The ballast is considered "mainline" ballast and is in good condition. Crushed rock is employed on the entire route with a minimum 6" over the ties and 12" on the shoulder. There are a few drainage problems (e.g., "plaster holes") which have to be continually dealt with, particularly on the Sydney Subdivision.

TRACK MAINTENANCE

Day-to-day maintenance of the track is carried out by local section work forces (seven gangs in total along the route) as described for the Halifax-Moncton rail line.

Programmed replacement work is undertaken much less than a standard main line. No rail programs are planned into the foreseeable future.

There are numerous bridges along the route. The swing bridge on the Canso Causeway and the Grand Narrows Bridge are the major ones. The latter has just undergone a major maintenance program. The bridges are mostly steel with some concrete spans.

TRACK INSPECTION

Track inspection is carried out as described for the Halifax-Moncton line.

There are three hotbox and dragging equipment detectors on each of the subdivisions.

TRAIN SPEEDS

Train speeds vary among zones within each subdivision as shown below in miles per hour.

	Rail Liner	Passenger	Freight
Sydney Subdivision	40-60	35-50	30-40
Hopewell Subdivision	50-60	45-55	35-45

There are some permanent slow across (as low as 10 mph) and many 30 to 35 mph speeds at curves.

OVERALL TRACK CONDITION

CN indicates that the route is more than satisfactory for the traffic density currently on the line. Maintenance costs are kept at a very high standard and could be reduced significantly if VIA Rail passenger services did not exist. There is some question if VIA Rail now pays adequate compensation to cover the additional expenses involved according to CN officials.

APPENDIX E

ROAD REVENUE AND EXPENDITURES

NOVA SCOTIA--1974/75

REVENUES:	GROSS	%	NET
GASOLINE TAX	49,670,000	100.0%	49,670,000
LESS COMMISSIONS		100.0%	
OTHER FUEL TAX	3,805,000	100.0%	3,805,000
LESS COMMISSIONS		100.0%	
LICENSES, REGISTRATION	18,694,624	100.0%	18,694,624
FINES	512,732	100.0%	512,732
TOLLS	642,982	100.0%	642,982
TRANSFERS FROM OTHER SOURCES	15,004,179	100.0%	15,004,179
TOTAL REVENUES (INCL.TRANSFERS):	88,329,517		88,329,517

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION							
OPERATIONS AND MAINTENANCE	37,876,474			100.0%	37,876,474	100.00%	37,876,474
PLANNING, DESIGN, SURVEYS	-						
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES	3,876,712			100.0%	3,876,712	100.00%	3,876,712
POLICY AND RESEARCH							
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES							
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	60,051,841	100.0%	60,051,841			100.00%	60,051,841
TOTAL PROVINCIAL EXPENDITURES:	101,805,027	58.99%	60,051,841	41.01%	41,753,186	100.00%	101,805,027
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL	(1,466,856)			100.0%	(1,466,856)	100.00%	(1,466,856)
FERRIES OPERATIONS	(53,087)	100.0%	(53,087)			100.00%	(53,087)
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(1,800,758)	100.0%	(1,800,758)			100.00%	(1,800,758)
--OPERATIONS	(698,499)			100.0%	(698,499)	100.00%	(698,499)
OTHER							
TOTAL TRANSFERS:	(4,019,200)	46.12%	(1,853,845)	53.88%	(2,165,355)	100.00%	(4,019,200)
OTHER PROVINCIAL EXPENSES:							
POLICE	4,766,020			55.0%	2,621,311	55.00%	2,621,311
COURTS	2,691,000			16.7%	449,397	16.70%	449,397
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	105,242,847	55.30%	58,197,996	40.53%	42,658,539	95.83%	100,856,535
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	2,499,257	72.1%	1,800,758	27.9%	698,499	100.00%	2,499,257
FUNDED BY MUNICIPALITY	20,247,143	32.9%	6,668,516	67.1%	13,578,627	100.00%	20,247,143
TOTAL LOCAL EXPENDITURES:	22,746,400	37.2%	8,469,274	62.8%	14,277,126	100.00%	22,746,400
TOTAL EXPENDITURES:	127,989,247	52.09%	66,667,270	44.48%	56,935,665	96.57%	123,602,935

TOTAL NET CAPITAL AND OPERATING EXPENSES:	123,602,935	PROVINCE'S NET EXPENDITURES:	103,355,792
TOTAL NET REVENUES:	88,329,517	PROVINCE'S NET REVENUES:	88,329,517
REVENUES AS PERCENT OF EXPENDITURES:	71.46%	REVENUES AS PERCENT OF EXPENDITURES:	85.46%

E:1

30 Aug-89

NOVA SCOTIA--1978/79

REVENUES:	GROSS					%	NET
GASOLINE TAX	54,623,000					100.0%	54,623,000
LESS COMMISSIONS						100.0%	
OTHER FUEL TAX	10,029,000					100.0%	10,029,000
LESS COMMISSIONS						100.0%	
LICENSES, REGISTRATION	26,536,988					100.0%	26,536,988
FINES	1,380,374					100.0%	1,380,374
TOLLS	716,719					100.0%	716,719
TRANSFERS FROM OTHER SOURCES	16,586,875					100.0%	16,586,875
TOTAL REVENUES (INCL.TRANSFERS):	109,872,956						109,872,956

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	INCLUDED BELOW						
OPERATIONS AND MAINTENANCE	58,062,507			100.0%	58,062,507	100.00%	58,062,507
PLANNING, DESIGN, SURVEYS							
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES	6,068,865			100.0%	6,068,865	100.00%	6,068,865
POLICY AND RESEARCH							
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES							
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	98,901,648	100.0%	98,901,648			100.00%	98,901,648
TOTAL PROVINCIAL EXPENDITURES:	163,033,020	60.66%	98,901,648	39.34%	64,131,372	100.00%	163,033,020
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL	(2,635,214)			100.0%	(2,635,214)	100.00%	(2,635,214)
FERRIES OPERATIONS	(784,847)	100.0%	(784,847)			100.00%	(784,847)
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(4,579,009)	100.0%	(4,579,009)			100.00%	(4,579,009)
--OPERATIONS	(694,843)			100.0%	(694,843)	100.00%	(694,843)
OTHER							
TOTAL TRANSFERS:	(8,693,913)	61.70%	(5,363,856)	38.30%	(3,330,057)	100.00%	(8,693,913)
OTHER PROVINCIAL EXPENSES:							
POLICE	8,740,775			55.0%	4,807,426	55.00%	4,807,426
COURTS	5,037,000			16.7%	841,179	16.70%	841,179
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	168,116,882	55.64%	93,537,792	39.53%	66,449,920	95.16%	159,987,712
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	5,273,852	86.8%	4,579,009	13.2%	694,843	100.00%	5,273,852
FUNDED BY MUNICIPALITY	25,504,448	27.0%	6,880,820	73.0%	18,623,628	100.00%	25,504,448
TOTAL LOCAL EXPENDITURES:	30,778,300	37.2%	11,459,829	62.8%	19,318,471	100.00%	30,778,300
TOTAL EXPENDITURES:	198,895,182	52.79%	104,997,621	43.12%	85,768,391	95.91%	190,766,012

TOTAL NET CAPITAL AND OPERATING EXPENSES: 190,766,012
TOTAL NET REVENUES: 109,872,956
REVENUES AS PERCENT OF EXPENDITURES: 57.60%

PROVINCE'S NET EXPENDITURES: 165,261,564
PROVINCE'S NET REVENUES: 109,872,956
REVENUES AS PERCENT OF EXPENDITURES: 66.48%

M-2

NOVA SCOTIA--1982/83

REVENUES:	GROSS		NET
GASOLINE TAX	82,410,000	100.0%	82,410,000
LESS COMMISSIONS		100.0%	
OTHER FUEL TAX	12,995,000	100.0%	12,995,000
LESS COMMISSIONS		100.0%	
LICENSES, REGISTRATION	29,460,351	100.0%	29,460,351
FINES	1,490,493	100.0%	1,490,493
TOLLS	618,408	100.0%	618,408
TRANSFERS FROM OTHER SOURCES	7,134,165	100.0%	7,134,165
TOTAL REVENUES (INCL.TRANSFERS):	134,108,417		134,108,417

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	INCLUDED BELOW						
OPERATIONS AND MAINTENANCE	77,660,346			100.0%	77,660,346	100.00%	77,660,346
PLANNING, DESIGN, SURVEYS							
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES	9,253,859			100.0%	9,253,859	100.00%	9,253,859
POLICY AND RESEARCH							
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES							
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	102,074,150	100.0%	102,074,150			100.00%	102,074,150
TOTAL PROVINCIAL EXPENDITURES:	188,988,355	54.01%	102,074,150	45.99%	86,914,205	100.00%	188,988,355
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL	(4,355,157)			100.0%	(4,355,157)	100.00%	(4,355,157)
FERRIES OPERATIONS	(1,204,697)	100.0%	(1,204,697)			100.00%	(1,204,697)
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(3,733,371)	100.0%	(3,733,371)			100.00%	(3,733,371)
--OPERATIONS	(1,133,827)			100.0%	(1,133,827)	100.00%	(1,133,827)
OTHER							
TOTAL TRANSFERS:	(10,427,052)	47.36%	(4,938,068)	52.64%	(5,488,984)	100.00%	(10,427,052)
OTHER PROVINCIAL EXPENSES:							
POLICE	18,185,991			55.0%	10,002,295	55.00%	10,002,295
COURTS	9,590,000			16.7%	1,601,530	16.70%	1,601,530
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	206,337,294	47.08%	97,136,082	45.09%	93,029,046	92.16%	190,165,128
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	4,867,198	76.7%	3,733,371	23.3%	1,133,827	100.00%	4,867,198
FUNDED BY MUNICIPALITY	30,053,702	30.8%	9,268,892	69.2%	20,784,810	100.00%	30,053,702
TOTAL LOCAL EXPENDITURES:	34,920,900	37.2%	13,002,263	62.8%	21,918,637	100.00%	34,920,900
TOTAL EXPENDITURES:	241,258,194	45.65%	110,138,345	47.65%	114,947,683	93.30%	225,086,028

TOTAL NET CAPITAL AND OPERATING EXPENSES:	225,086,028	PROVINCE'S NET EXPENDITURES:	195,032,326
TOTAL NET REVENUES:	134,108,417	PROVINCE'S NET REVENUES:	134,108,417
REVENUES AS PERCENT OF EXPENDITURES:	59.58%	REVENUES AS PERCENT OF EXPENDITURES:	68.76%

NOVA SCOTIA--1986/87

REVENUES:	GROSS		NET
GASOLINE TAX	90,115,000		
LESS COMMISSIONS		100.0%	90,115,000
OTHER FUEL TAX	21,143,000	100.0%	
LESS COMMISSIONS		100.0%	21,143,000
LICENSES, REGISTRATION	37,294,200	100.0%	
FINES	1,930,197	100.0%	37,294,200
TOLLS	714,060	100.0%	1,930,197
TRANSFERS FROM OTHER SOURCES	12,243,003	100.0%	714,060
		100.0%	12,243,003
TOTAL REVENUES (INCL.TRANSFERS):	163,439,460		163,439,460

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	INCLUDED BELOW						
OPERATIONS AND MAINTENANCE	94,766,115			100.0%	94,766,115	100.00%	94,766,115
PLANNING, DESIGN, SURVEYS							
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES	12,320,024			100.0%	12,320,024	100.00%	12,320,024
POLICY AND RESEARCH							
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES							
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	90,245,713	100.0%	90,245,713			100.00%	90,245,713
TOTAL PROVINCIAL EXPENDITURES:	197,331,852	45.73%	90,245,713	54.27%	107,086,139	100.00%	197,331,852
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL	(749,357)	100.0%	(749,357)			100.00%	(749,357)
FERRIES OPERATIONS	(4,652,070)			100.0%	(4,652,070)	100.00%	(4,652,070)
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(4,816,654)	100.0%	(4,816,654)			100.00%	(4,816,654)
--OPERATIONS	(1,371,778)			100.0%	(1,371,778)	100.00%	(1,371,778)
OTHER							
TOTAL TRANSFERS:	(11,589,859)	48.02%	(5,566,011)	51.98%	(6,023,848)	100.00%	(11,589,859)
OTHER PROVINCIAL EXPENSES:							
POLICE	24,295,195			55.0%	13,362,357	55.00%	13,362,357
COURTS	9,514,000			16.7%	1,588,838	16.70%	1,588,838
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	219,551,188	38.57%	84,679,702	52.84%	116,013,486	91.41%	200,693,188
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	6,188,432	77.8%	4,816,654	22.2%	1,371,778	100.00%	6,188,432
FUNDED BY MUNICIPALITY	44,040,568	31.5%	13,885,346	68.5%	30,155,222	100.00%	44,040,568
TOTAL LOCAL EXPENDITURES:	50,229,000	37.2%	18,702,000	62.8%	31,527,000	100.00%	50,229,000
TOTAL EXPENDITURES:	269,780,188	38.32%	103,381,702	54.69%	147,540,486	93.01%	250,922,188

TOTAL NET CAPITAL AND OPERATING EXPENSES:	250,922,188	PROVINCE'S NET EXPENDITURES:	206,881,620
TOTAL NET REVENUES:	163,439,460	PROVINCE'S NET REVENUES:	163,439,460
REVENUES AS PERCENT OF EXPENDITURES:	65.14%	REVENUES AS PERCENT OF EXPENDITURES:	79.00%

NEW BRUNSWICK--1986/87

REVENUES:	GROSS	%	NET
GASOLINE TAX		100.0%	
LESS COMMISSIONS		100.0%	
OTHER FUEL TAX	105,648,000	100.0%	105,648,000
LESS COMMISSIONS		100.0%	
LICENSES, REGISTRATION	39,213,883	100.0%	39,213,883
FINES	2,453,026	100.0%	2,453,026
TOLLS		100.0%	
TRANSFERS FROM OTHER SOURCES	13,198,000	100.0%	13,198,000
TOTAL REVENUES (INCL.TRANSFERS):	160,512,909		160,512,909

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	INCLUDED BELOW						
OPERATIONS AND MAINTENANCE	117,842,785			100.0%	117,842,785	100.00%	117,842,785
PLANNING, DESIGN, SURVEYS							
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES	INCLUDED ABOVE			100.0%			
POLICY AND RESEARCH							
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES							
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	128,493,005	100.0%	128,493,005			100.00%	128,493,005
TOTAL PROVINCIAL EXPENDITURES:	246,335,790	52.16%	128,493,005	47.84%	117,842,785	100.00%	246,335,790
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL	(8,734,854)			100.0%	(8,734,854)	100.00%	(8,734,854)
FERRIES OPERATIONS	(499,668)	100.0%	(499,668)			100.00%	(499,668)
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(4,471,515)	100.0%	(4,471,515)			100.00%	(4,471,515)
--OPERATIONS	(357,896)			100.0%	(357,896)	100.00%	(357,896)
OTHER	(69,247)	100.00%	(69,247)			100.00%	(69,247)
TOTAL TRANSFERS:	(14,133,180)	35.66%	(5,040,430)	64.34%	(9,092,750)	100.00%	(14,133,180)
OTHER PROVINCIAL EXPENSES:							
POLICE	23,586,000			55.0%	12,972,300	55.00%	12,972,300
COURTS	13,524,000			16.7%	2,258,508	16.70%	2,258,508
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	269,312,610	45.84%	123,452,575	46.04%	123,980,843	91.88%	247,433,418
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	4,829,411	92.6%	4,471,515	7.4%	357,896	100.00%	4,829,411
FUNDED BY MUNICIPALITY	54,761,389	32.3%	17,695,485	67.7%	37,065,904	100.00%	54,761,389
TOTAL LOCAL EXPENDITURES:	59,590,800	37.2%	22,167,000	62.8%	37,423,800	100.00%	59,590,800
TOTAL EXPENDITURES:	328,903,410	44.27%	145,619,575	49.07%	161,404,643	93.35%	307,024,218

TOTAL NET CAPITAL AND OPERATING EXPENSES:	307,024,218	PROVINCE'S NET EXPENDITURES:	252,262,829
TOTAL NET REVENUES:	160,512,909	PROVINCE'S NET REVENUES:	160,512,909
REVENUES AS PERCENT OF EXPENDITURES:	52.28%	REVENUES AS PERCENT OF EXPENDITURES:	63.63%

30-Aug-89

MANITOBA--1986/87

REVENUES:	GROSS	%	NET
GASOLINE TAX	115,908,810	100.0%	115,908,810
LESS COMMISSIONS	(179,034)	100.0%	(179,034)
OTHER FUEL TAX	57,037,649	100.0%	57,037,649
LESS COMMISSIONS	(81,638)	100.0%	(81,638)
LICENSES, REGISTRATION	40,893,777	100.0%	40,893,777
FINES	6,291,963	50.0%	3,145,982
TOLLS			
TRANSFERS FROM OTHER SOURCES	2,900,000	100.0%	2,900,000
TOTAL REVENUES (INCL.TRANSFERS):	222,771,527		219,625,546

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	3,080,104	54.0%	1,663,256	46.0%	1,416,848	100.00%	3,080,104
OPERATIONS AND MAINTENANCE	68,881,653			100.0%	68,881,653	100.00%	68,881,653
PLANNING, DESIGN, SURVEYS	2,766,050	100.0%	2,766,050			100.00%	2,766,050
ENGINEERING AND TECHNICAL SERVICES	11,876,855	100.0%	11,876,855			100.00%	11,876,855
REGISTRY OF MOTOR VEHICLES	12,498,941			100.0%	12,498,941	100.00%	12,498,941
POLICY AND RESEARCH	1,200,022	54.0%	648,012	46.0%	552,010	100.00%	1,200,022
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES	1,135,377	54.0%	613,104	46.0%	522,273	100.00%	1,135,377
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	95,258,340	100.0%	95,258,340			100.00%	95,258,340
TOTAL PROVINCIAL EXPENDITURES:	196,697,342	57.36%	112,825,617	42.64%	83,871,725	100.00%	196,697,342
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL							
FERRIES OPERATIONS		100.0%					
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(5,781,664)	100.0%	(5,781,664)			100.00%	(5,781,664)
--OPERATIONS	(2,762,386)			100.0%	(2,762,386)	100.00%	(2,762,386)
OTHER							
TOTAL TRANSFERS:	(8,544,050)	67.67%	(5,781,664)	32.33%	(2,762,386)	100.00%	(8,544,050)
OTHER PROVINCIAL EXPENSES:							
POLICE	33,801,000			55.0%	18,590,550	55.00%	18,590,550
COURTS	24,738,000			16.7%	4,131,246	16.70%	4,131,246
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	246,692,292	43.39%	107,043,953	42.09%	103,831,135	85.48%	210,875,088
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	8,544,050	67.7%	5,781,664	32.3%	2,762,386	100.00%	8,544,050
FUNDED BY MUNICIPALITY	137,829,250	36.1%	49,804,136	63.9%	88,025,114	100.00%	137,829,250
TOTAL LOCAL EXPENDITURES:	146,373,300	38.0%	55,585,800	62.0%	90,787,500	100.00%	146,373,300
TOTAL EXPENDITURES:	393,065,592	41.37%	162,629,753	49.51%	194,618,635	90.89%	357,248,388

TOTAL NET CAPITAL AND OPERATING EXPENSES:	357,248,388	PROVINCE'S NET EXPENDITURES:	219,419,138
TOTAL NET REVENUES:	219,625,546	PROVINCE'S NET REVENUES:	219,625,546
REVENUES AS PERCENT OF EXPENDITURES:	61.48%	REVENUES AS PERCENT OF EXPENDITURES:	100.09%

ONTARIO--1986/87

REVENUES:	GROSS						NET
GASOLINE TAX	988,800,093					100.0%	988,800,093
LESS COMMISSIONS							
OTHER FUEL TAX	265,592,367					100.0%	265,592,367
LESS COMMISSIONS							
LICENSES, REGISTRATION	484,507,315					100.0%	484,507,315
FINES	95,394,354					50.0%	47,697,177
TOLLS							
TRANSFERS FROM OTHER SOURCES	3,044,000					100.0%	3,044,000
TOTAL REVENUES (INCL.TRANSFERS):	1,837,338,129						1,789,640,952

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	96,475,838	54.0%	52,096,953	46.0%	44,378,885	100.00%	96,475,838
OPERATIONS AND MAINTENANCE	513,822,168			100.0%	513,822,168	100.00%	513,822,168
PLANNING, DESIGN, SURVEYS	72,143,991	100.0%	72,143,991			100.00%	72,143,991
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES							
POLICY AND RESEARCH	12,958,132	54.0%	6,997,391	46.0%	5,960,741	100.00%	12,958,132
INTERNAL MANAGEMENT AND SUPPORT							
BOARDS AND COMMITTEES							
SAFETY AND REGULATION	89,885,706			100.0%	89,885,706	100.00%	89,885,706
CONSTRUCTION/CAPITAL	477,406,990	100.0%	477,406,990			100.00%	477,406,990
TOTAL PROVINCIAL EXPENDITURES:	1,262,692,825	48.20%	608,645,324	51.80%	654,047,500	100.00%	1,262,692,825
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL							
FERRIES OPERATIONS							
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(262,724,216)	100.0%	(262,724,216)			100.00%	(262,724,216)
--OPERATIONS	(334,376,274)			100.0%	(334,376,274)	100.00%	(334,376,274)
OTHER							
TOTAL TRANSFERS:	(597,100,490)	44.00%	(262,724,216)	56.00%	(334,376,274)	100.00%	(597,100,490)
OTHER PROVINCIAL EXPENSES:							
POLICE	368,030,812			45.2%	166,497,139	45.24%	166,497,139
COURTS	166,497,139			16.7%	27,805,022	16.70%	27,805,022
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	1,200,120,286	28.82%	345,921,109	42.83%	513,973,387	71.65%	859,894,496
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	597,100,490	44.0%	262,724,216	56.0%	334,376,274	100.00%	597,100,490
FUNDED BY MUNICIPALITY	597,100,490	44.0%	262,724,216	56.0%	334,376,274	100.00%	597,100,490
TOTAL LOCAL EXPENDITURES:	1,194,200,980	44.0%	525,448,431	56.0%	668,752,549	100.00%	1,194,200,980
TOTAL EXPENDITURES:	2,394,321,266	36.39%	871,369,540	49.40%	1,182,725,936	85.79%	2,054,095,476

TOTAL NET CAPITAL AND OPERATING EXPENSES:	2,054,095,476	PROVINCE'S NET EXPENDITURES:	1,456,994,986
TOTAL NET REVENUES:	1,789,640,952	PROVINCE'S NET REVENUES:	1,789,640,952
REVENUES AS PERCENT OF EXPENDITURES:	87.13%	REVENUES AS PERCENT OF EXPENDITURES:	122.83%

QUEBEC--1986/87

REVENUES:	GROSS					%	NET
GASOLINE TAX						100.0%	
LESS COMMISSIONS						100.0%	
OTHER FUEL TAX	1,144,655,000					100.0%	1,144,655,000
LESS COMMISSIONS						100.0%	
LICENSES, REGISTRATION	313,867,000					100.0%	313,867,000
FINES	33,966,000					100.0%	33,966,000
TOLLS						100.0%	
TRANSFERS FROM OTHER SOURCES	19,625,000					100.0%	19,625,000
TOTAL REVENUES (INCL.TRANSFERS):	1,512,113,000						1,512,113,000

EXPENDITURES:	GROSS	NET CAPITAL %	NET CAPITAL $	NET OPERATING %	NET OPERATING $	NET TOTAL %	NET TOTAL $
PROVINCIAL TRANSPORTATION EXPENSES:							
ADMINISTRATION	INCLUDED BELOW						
OPERATIONS AND MAINTENANCE	428,603,000			100.0%	428,603,000	100.00%	428,603,000
PLANNING, DESIGN, SURVEYS							
ENGINEERING AND TECHNICAL SERVICES							
REGISTRY OF MOTOR VEHICLES	INCLUDED ABOVE						
POLICY AND RESEARCH							
INTERNAL MANAGEMENT AND SUPPORT	52,847,000	68.0%	35,935,960	32.0%	16,911,040	100.00%	52,847,000
BOARDS AND COMMITTEES							
SAFETY AND REGULATION							
CONSTRUCTION/CAPITAL	328,859,000	100.0%	328,859,000			100.00%	328,859,000
TOTAL PROVINCIAL EXPENDITURES:	810,309,000	45.02%	364,794,960	54.98%	445,514,040	100.00%	810,309,000
LESS TRANSFERS TO OTHERS:							
FERRIES CAPITAL							
FERRIES OPERATIONS		100.0%					
TRANSFERS TO LOCAL GOVERNMENTS							
--CAPITAL	(17,085,440)	100.0%	(17,085,440)			100.00%	(17,085,440)
--OPERATIONS	(39,336,560)			100.0%	(39,336,560)	100.00%	(39,336,560)
OTHER							
TOTAL TRANSFERS:	(56,422,000)	30.28%	(17,085,440)	69.72%	(39,336,560)	100.00%	(56,422,000)
OTHER PROVINCIAL EXPENSES:							
POLICE	341,190,000			55.0%	187,654,500	55.00%	187,654,500
COURTS	97,080,000			16.7%	16,212,360	16.70%	16,212,360
TOTAL PROVINCIAL EXPENDITURES (NET OF TRANSFERS)	1,192,157,000	29.17%	347,709,520	51.17%	610,044,340	80.34%	957,753,860
LOCAL TRANSPORTATION EXPENSES:							
FUNDED BY PROVINCE	56,422,000	30.3%	17,085,440	69.7%	39,336,560	100.00%	56,422,000
FUNDED BY MUNICIPALITY	557,411,300	40.4%	224,917,360	59.6%	332,493,940	100.00%	557,411,300
TOTAL LOCAL EXPENDITURES:	613,833,300	39.4%	242,002,800	60.6%	371,830,500	100.00%	613,833,300
TOTAL EXPENDITURES:	1,805,990,300	32.65%	589,712,320	54.37%	981,874,840	87.02%	1,571,587,160

TOTAL NET CAPITAL AND OPERATING EXPENSES: 1,571,587,160
TOTAL NET REVENUES: 1,512,113,000
REVENUES AS PERCENT OF EXPENDITURES: 96.22%

PROVINCE'S NET EXPENDITURES: 1,014,175,860
PROVINCE'S NET REVENUES: 1,512,113,000
REVENUES AS PERCENT OF EXPENDITURES: 149.10%

NOTES TO TABLES

DATA SOURCES

Wherever possible, **Department of Transportation Annual Reports** served as the primary sources of data. If the required information was not available from those reports, **Public Accounts** were consulted. If an additional source was necessary, **Statistics Canada** data were employed. Data derived from those sources appear in the revenue and expenditure statements under the column labelled "Gross".

PERCENTAGE COLUMNS

The columns labelled "%" represent the percentages of revenues and expenditures which apply to road revenues or expenses. Many revenues and expenditures (e.g., toll revenues and construction expenditures) are wholly attributable to a specific category. In other cases (e.g., offense fine revenues or police expenditures), only portions are attributable. In those situations, the numbers appearing under "%" are less than 100%.

ALLOCATIONS

These were the allocations made by the study team:

- Based on estimates derived in a 1982 study for VIA Rail by Peat Marwick:
  - 55% of police expenditures and 16.7% of court expenditures were allocated to the road systems (estimates based on unpublished information)
  - 50% of offense fine revenues were allocated to the road systems, unless identified in a data source as being completely road-related (estimates based on unpublished information).
  - In Ontario, a 54/46% split was applied to those provincial capital and operating expenditures that are not separated in public sources. This split was based on research in the 1982 study. The same split was applied to Manitoba in this study.
  - In Quebec, a 68/32% split was applied to those provincial capital and operating expenditures in Quebec that are not separated in public sources (based on the research above).
  - All other splits between provincial capital and operating expenses were identifiable from Department of Transportation reports.

- 90% of all local "road and street" expenditures (as reported by Statistics Canada) were allocated to roads in New Brunswick, Nova Scotia (for 1982/83 and 1986/87), Quebec, and Manitoba. The 90% figure was based on an analysis of pre-1979 Statistics Canada reporting methods which made it possible to exclude such expenditures as street lighting and other expenditures not related to this study. Appropriate data for Ontario were available from MTO reports.

- The splits between local operating expenditures and local capital expenditures in Nova Scotia for 1974/75, 1978/79 and 1982/83 were based on the same split as reported in Statistics Canada's latest publication for 1986. Such splits were not published for prior years.

- Transfers to local governments for road expenditures in New Brunswick and Manitoba were derived from Statistics Canada data by taking the ratio of local expenditures on roads to total local expenditures on "transportation and communication", and multiplying that ratio by the amount transferred to local governments for "transportation and communication". Appropriate data for Nova Scotia, Ontario and Quebec were available from Department of Transportation reports.

APPENDIX F

TRUCK COSTS AND RATES

SHIPMENTS BY CLASS I & II CARRIERS TO NOVA SCOTIA*
(EXCLUDES INTRA-NOVA SCOTIA SHIPMENTS)

FROM THE ATLANTIC PROVINCES

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$12,839	513	197,686	$25.01	$0.065
1978	$15,133	451	198,800	$33.55	$0.076
1982	$29,622	610	247,496	$48.56	$0.120
1986	$36,589	807	311,396	$45.34	$0.117

FROM OTHER PROVINCES

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$32,436	343	542,460	$94.43	$0.060
1978	$33,195	256	403,498	$129.72	$0.082
1982	$69,435	431	646,075	$161.10	$0.107
1986	$85,879	487	804,832	$176.34	$0.107

* 1975 & 1978 figures include Class III carriers

SHIPMENTS BY CLASS I & II CARRIERS FROM NOVA SCOTIA*
(EXCLUDES INTRA-NOVA SCOTIA SHIPMENTS)

TO THE ATLANTIC PROVINCES

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$18,424	1,070	463,375	$17.22	$0.040
1978	$13,357	362	193,982	$36.88	$0.069
1982	$24,078	540	233,467	$44.59	$0.103
1986	$31,886	843	323,629	$37.82	$0.099

TO OTHER PROVINCES

Year	Revenue (000)	Tonnes (000)	Tonne-Kms. (000)	Revenue Per Tonne	Revenue per Tonne-Km.
1975	$11,815	352	531,449	$33.57	$0.022
1978	$10,460	162	260,680	$64.74	$0.040
1982	$20,712	164	257,256	$126.29	$0.081
1986	$31,917	259	395,733	$123.23	$0.081

* 1975 & 1978 figures include Class III carriers

FUEL TAXES PAID BY CLASS I,II & III FOR-HIRE CARRIERS DOMICILED IN NOVA SCOTIA

A) DIESEL FUEL:

Year	Litres	Fuel Tax (¢/l)			Total Fed. Tax	Total Prov. Tax
		Fed. Sales	Fed. Excise	Prov.		
1975	23,502,863	0.73	0.00	5.90	$172,552	$1,386,669
1978	33,636,242	1.01	0.00	5.90	$339,726	$1,984,538
1982	37,705,121	2.67	0.00	7.20	$1,005,585	$2,714,769
1986	36,472,883	3.50	2.00	9.20	$2,006,009	$3,355,505

B) GASOLINE:

Year	Litres	Fuel Tax (¢/l)			Total Fed. Tax	Total Prov. Tax
		Fed. Sales	Fed. Excise*	Prov.		
1975	12,499,771	0.78	0.00	4.60	$97,285	$574,989
1978	10,751,597	1.21	0.00	4.60	$130,094	$494,573
1982	5,941,215	2.78	0.00	7.00	$165,318	$415,885
1986	3,803,600	3.84	2.00	8.90	$222,130	$338,520

Note: All fuel is assumed to have been purchased in Nova Scotia.

For-hire truckers consumed a small amount of propane in 1986, which was not included in fuel tax calculations (does not materially affect results).

* In 1975, 1978, and 1982 the federal excise tax on gasoline was 100% refundable for commercial enterprises. The excise tax on gasoline was 3.5¢ in 1986, of which 1.5¢ was refundable.

REGISTRATION FEES PAID BY CLASS I,II & III FOR-HIRE CARRIERS DOMICILED IN NOVA SCOTIA (Adjusted to Include Brokers Working for Them)

Year	Straight Trucks		Tractor-Trailers		Trailers			Total Fees	Broker Factor [4]	Adjusted Total
	#	Rate [1]	#	Rate [2]	#	Rate [3]	Amort.			
1975	562	$414	538	$814	940	$10	100%	$680,000	15.8%	$787,268
1978	570	$414	700	$1,102	1212	$25	10%	$1,010,410	14.2%	$1,154,373
1982	462	$465	728	$1,267	1299	$25	10%	$1,140,454	24.4%	$1,418,305
1986	466	$481	816	$1,280	1413	$25	10%	$1,272,159	23.0%	$1,564,991

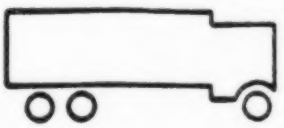
Notes:

[1] Assuming a representative gross vehicle weight of 15 tonnes
[2] Assuming a representative gross vehicle weight of 29.5 tonnes for 1975 and 40 tonnes for 1978-86 (the 1975 regulations were more restrictive)
[3] There was a $10 annual registration fee for semi-trailers in 1975. By 1978, the annual fee had been replaced with a $25 one time charge. Our calculations amortize the $25 over ten years (approximate life of a trailer).
[4] Broker factors estimate the percentage of freight contracted out to owner operaters. They are based on Statistics Canada data (broker fees divided by the sum of tranportation expenses, equipment rentals, depreciation of revenue equipment, and other maintenance expenses).

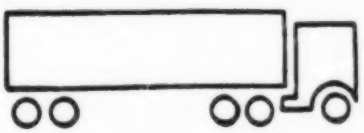
SCHEMATICS OF SINGLE UNIT AND COMBINATION TRUCKS

2-AXLE STRAIGHT TRUCK

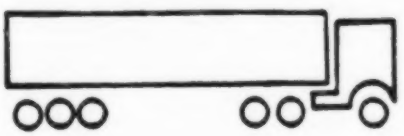
3-AXLE TANDEM STRAIGHT TRUCK



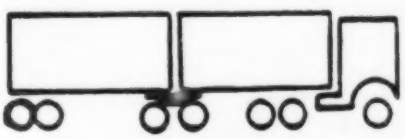
5-AXLE TRACTOR/SEMI-TRAILER



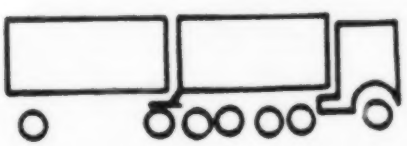
6-AXLE TRACTOR/SEMI-TRAILER
(WITH TRIDEM AXLE ON SEMI-TRAILER)



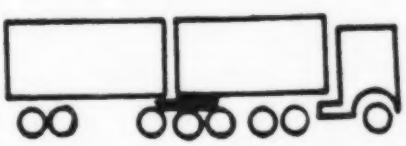
B-TRAIN (7-AXLE)



A-TRAIN (7-AXLE)
(C-TRAIN SAME AS A-TRAIN BUT WITH DOUBLE DRAWBAR CONNECTION BETWEEN TRAILERS)



B TRAIN (8 AXLE)



Source: IBI/ADI: "Economics of Truck Sizes and Weights in Canada", July 1987.

APPENDIX G

RAIL COSTING METHODS

APPENDIX G

RAIL COSTING METHODS

Railway costs were estimated for two different purposes in the present project: first, for comparison with truck costs as part of the traffic diversion analysis (cf. Chapter VI, section entitled "Evolution of Road and Rail Traffic"); second, for use in determining the viability of the two major rail lines in Nova Scotia (cf. Chapter VI, sections entitled "Truro-Sydney Line Viability" and "Halifax-Moncton Line Viability").

ANALYTICAL FRAMEWORK

There are a number of differences between the cost analyses carried out for the two purposes noted above. For the most part these follow from differences in the underlying model or framework within which the analyses were carried out.

Compensatory Rate Model

The cost estimates used in the traffic diversion analysis were developed on the basis of a "compensatory rate" model. Section 112 of the 1987 National Transportation Act requires all rates to be compensatory, i.e., in excess of the variable cost of transportation. The term "variable cost" as used here is well-defined through previous CTC decisions and railway and CTC costing practices. This provided an appropriate framework for developing costs for the traffic diversion analysis, since it represents, in effect, the minimum rate which the railway can charge under the law.

Branch-Line vs. Short-Line Models

The choice of a framework for the viability analysis was not so clear-cut. We considered two models for this purpose: a branch-line model and a short-line model.

The branch-line model is based on NTA-approved procedures for the costing of branch lines for abandonment or subsidy purposes. As with NTA-approved costing for commercial freight, branch line costing procedures are well-established and well-documented. These differ from comparable procedures for the costing of commercial traffic in a number of respects. For example, the fixed costs of the line itself are included. On the other hand, depreciation and cost of capital charges for branch line investment are calculated on a reduced basis.

The short-line model is less well-defined and requires more judgement on the part of the analyst. It consists of simply viewing the sub-system of the railway as if it were operated by a separate company as a small railway.

A key difference between the two models is their treatment of off-line revenues (i.e., revenues earned during the portion of the rail haul beyond the branch line or small railway). The branch-line model allocates all of the contribution (excess of revenue over variable cost) on branch line traffic to the branch line itself. This is required by the wording of the National Transportation Act. As an operating hypothesis, it would seem to require that branch line traffic is lost to the railway altogether with the disappearance of the branch line, i.e., that none of this traffic is retained elsewhere on the system through intermodal arrangements.

The short-line model assumes that revenues are shared between the large and small railway through some sort of revenue division arrangement. These are typically favourable to the smaller railway, partly in recognition of the higher unit costs of small-scale operations and partly because the larger railway is in danger of losing profitable traffic if the small railway fails.

We selected the short-line railway model in the present instance for a number of reasons. As noted above, the branch-line model would be appropriate if none of the traffic on the lines in question were to be retained by CN in the absence of these lines. In the present instance, however, CN could retain a certain amount of the traffic in question, partly through its intermodal facilities at Moncton and partly through construction of bulk transfer facilities for traffic not suitable for piggyback operations. More fundamentally, we believe this model corresponds more closely to the way in which CN would evaluate the lines in question if they were considered as a separate profit centre within CN.

Implementation of Short-Line Model

Some key assumptions and procedures followed in applying the short-line model are as follows. Administrative costs were allocated from total CN costs, rather than estimated on a specific basis for an operation of the type in question. In this respect our analysis resembles a "CN profit centre" model rather than a feasibility study for an independent short-line. Moncton was selected as the interchange point between CN and the Nova Scotia railway. CN assets were valued at net book value.

COMMON FEATURES

Although there are several important differences between the cost methods employed for the traffic diversion analysis and those employed for the viability analyses, they nevertheless share a number of common features.

Peat Marwick Model

Costs for both purposes are based on a computerized model maintained by Peat Marwick. This model uses Statistics Canada publications as its main data source and can be updated annually with the publication of the relevant reports. In the present case the most recently published reports covered the year 1986. Cost results were therefore developed at 1986 cost levels, then indexed to 1987 to make them comparable to the revenue data provided by CN.

NTA-Approved Methods

The Peat Marwick model follows NTA-approved costing methods to the extent possible given our lack of access to confidential data. In the present instance some additional deviations from NTA-approved methods were introduced to adapt the model to the case at hand.

NTA-approved costing methods seek to determine long-run variable costs[1]. Regression analyses and other techniques are used to determine the degree of variability of the various

1. "Avoidable" rather than "variable" costs are developed for the on-line portion of branch-line costs. Some of the differences between the two concepts are discussed in the preceding section.

railway accounts and to associate their variable components with particular operating statistics[2] (e.g. gross ton-miles, train-miles). This results in a series of unit costs which are then applied to a particular shipment according to the service units[2] (gross ton-miles etc.) it incurs.

These methods are applied equally to operating expense and to investment data. Two types of cost relating to investment are developed: depreciation and cost of capital. Thus, NTA-approved costs include a return to investment insofar as it is found to be variable with the traffic under study. They do not, however, include any allocation of fixed costs[3].

NTA-approved methods also encompass the direct assignment of costs to freight traffic where this is feasible (i.e., the use of "specific", rather than "unit" costs). This typically requires access to confidential railway data and cannot be duplicated by independent consultants lacking such access. Therefore, unit costs have been used for all cost elements in the present case.

Data Sources

Both cost and operating data are needed to estimate costs for a given shipment or railway sub-system. As noted above, unit costs were developed for most cost elements through Peat Marwick's cost model which, in turn, is based primarily on Statistics Canada publications. For train crew wages, these would reflect a system-average crew size of between three and four men. Should average crew size decline by the year 2000, these costs may be somewhat overstated.

Freight car costs were based on per diem rates developed from a print-out of UMLER (Universal Machine-Language Equipment Register) files purchased from the Association of American Railroads. These are used primarily because the Statistics Canada publications do not provide data by car type. As with the NTA-approved costs, per diem rates include maintenance expense, depreciation and a cost of capital based on net book value.

---

2. The term "operating statistics" is used for data at the system level. Comparable data relating to a freight shipment, passenger train or branch line are referred to as "output units" or "service units".
3. As noted in the preceding section, fixed costs specific to a branch line are identified and included in the on-line costs of the line. The variable costs of commercial freight shipments and off-line movements of branch line traffic do not include any such costs. In neither case is there an across-the-board allocation of system-level fixed cost.

Our sources for operating data were CN, the shipper survey, published data on U.S. railways and Peat Marwick's knowledge of railway operations. CN provided a listing of traffic by subdivision at 1987 levels. This was adjusted where necessary to estimated 1994 traffic levels.[4] Operating data required to calculate train-related costs (train-miles, linehaul diesel unit-miles) were drawn from different sources for the two types of analysis. This is explained in the following section.

DIFFERENCES BETWEEN THE TWO TYPES OF COSTING

As noted above, there are a number of differences between the costing methods used for the traffic diversion analysis and those used for the railway viability analyses.

Whole Movement vs. Nova Scotia Portion

In costing prototype movements for the traffic diversion analysis, costs were estimated for the whole movement from origin to destination. By contrast, for the viability analysis, costs were developed for the Nova Scotia portion (including New Brunswick as far as Moncton) only.

Treatment of Train-Related Costs

In costing the prototype movements train-related costs (e.g., crew wages, dispatching costs, linehaul locomotive-related costs) were calculated for each shipment. The operating characteristics (train size, locomotives per train) were based on U.S. averages for way- and through-trains.

In developing costs by line for the viability analyses, the variable costs were subdivided into car-related and train-related components. Car-related costs were developed separately for each major shipment. The smaller shipments were grouped at the subdivision level, and car-related costs were developed for each such group.

---

4. Traffic levels were assumed to stay steady from 1994 to the year 2000.

Train-related costs were developed at the subdivision level only. Operating data for these costs were developed from CN's descriptions of current operations. Service levels were adjusted to accommodate 1994 traffic levels where these were expected to be significantly different from current levels.[4]

This approach was used for two reasons. First, this method did not require the association of particular shipments with particular trains. This would have been difficult in some cases, and the information is not strictly necessary if the centre of interest is the subsystem as a whole, rather than particular shipments. Second, this allowed us to vary the level of service (trains per week) and estimate the resulting change in costs in a relatively simple fashion, i.e., without having to recost every shipment on the line in question.

Fixed Costs

Fixed costs were included in the estimates developed for the viability analysis, but excluded for the traffic diversion analysis. These consist of infrastructure costs (maintenance, depreciation and interest — primarily on track and roadway) and administrative costs, both functional (engineering, mechanical and transportation) and general. System average costs per mile were developed and applied to the lines under study.

Cost of Capital

A cost of capital rate of 18.5% was applied to net book values in the development of costs for the traffic diversion analysis. This is the rate approved by the NTA for commercial freight applications for the year 1986. An interest rate of 13% was used in a similar fashion in developing costs for the viability analyses. This was taken as a commercial rate — one that CN might apply in evaluating the viability of these lines considered as a profit centre, or a rate that an outside party might pay on debt used to purchase the lines.

KPMG Peat Marwick Stevenson & Kellogg

APPENDIX H

YEAR 2000 VIABILITY STATEMENTS FOR HALIFAX-MONCTON AND TRURO-SYDNEY RAIL LINES

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

High Revenue Division
Chester Subdivision at 0%
Impex Traffic at 100%

1987 $

REVENUES	
Carload	$34,431,000
MFRA/ARFAA Payments	$1,486,000
Subtotal	$35,917,000
Containers	$46,163,000
Total Revenues	$82,080,000
OPERATING COSTS	
Variable	
Crews	$4,455,000
Fuel	$5,513,000
Equipment	$13,741,000
Infrastructure	$12,117,000
Other	$13,440,000
Subtotal	$49,266,000
Fixed	
Infrastructure	$1,719,000
All Other	$852,000
Subtotal	$2,571,000
Total Operating Costs	$51,837,000
GROSS MARGIN	$30,243,000
OWNERSHIP COSTS	
Variable	
Equipment	$940,000
Infrastructure	$7,311,000
Subtotal	$8,251,000
Fixed (Infrastructure)	$3,695,000
Total Ownership Costs	$11,946,000
PROFIT (LOSS)	$18,297,000

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

High Revenue Division
Chester Subdivision at 100%
Impex Traffic at 100%

1987 $

REVENUES	
Carload	$36,237,000
MFRA/ARFAA Payments	$1,541,000
Subtotal	$37,778,000
Containers	$46,163,000
Total Revenues	$83,941,000
OPERATING COSTS	
Variable	
Crews	$4,752,000
Fuel	$5,638,000
Equipment	$14,184,000
Infrastructure	$12,363,000
Other	$13,658,000
Subtotal	$50,595,000
Fixed	
Infrastructure	$2,560,000
All Other	$1,269,000
Subtotal	$3,829,000
Total Operating Costs	$54,424,000
GROSS MARGIN	$29,517,000
OWNERSHIP COSTS	
Variable	
Equipment	$981,000
Infrastructure	$7,462,000
Subtotal	$8,443,000
Fixed (Infrastructure)	$5,501,000
Total Ownership Costs	$13,944,000
PROFIT (LOSS)	$15,573,000

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

Medium Revenue Division
Chester Subdivision at 0%
Impex Traffic at 100%

1987 $

REVENUES	
Carload	$29,264,000
MFRA/ARFAA Payments	$846,000
Subtotal	$30,110,000
Containers	$46,163,000
Total Revenues	$76,273,000
OPERATING COSTS	
Variable	
Crews	$4,455,000
Fuel	$5,513,000
Equipment	$13,741,000
Infrastructure	$12,117,000
Other	$13,440,000
Subtotal	$49,266,000
Fixed	
Infrastructure	$1,719,000
All Other	$852,000
Subtotal	$2,571,000
Total Operating Costs	$51,837,000
GROSS MARGIN	$24,436,000
OWNERSHIP COSTS	
Variable	
Equipment	$940,000
Infrastructure	$7,311,000
Subtotal	$8,251,000
Fixed (Infrastructure)	$3,695,000
Total Ownership Costs	$11,946,000
PROFIT (LOSS)	$12,490,000

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

Medium Revenue Division
Chester Subdivision at 100%
Impex Traffic at 100%

1987 $

REVENUES	
Carload	$30,700,000
MFRA/ARFAA Payments	$863,000
Subtotal	$31,563,000
Containers	$46,163,000
Total Revenues	$77,726,000
OPERATING COSTS	
Variable	
Crews	$4,752,000
Fuel	$5,638,000
Equipment	$14,184,000
Infrastructure	$12,363,000
Other	$13,658,000
Subtotal	$50,595,000
Fixed	
Infrastructure	$2,560,000
All Other	$1,269,000
Subtotal	$3,829,000
Total Operating Costs	$54,424,000
GROSS MARGIN	$23,302,000
OWNERSHIP COSTS	
Variable	
Equipment	$981,000
Infrastructure	$7,462,000
Subtotal	$8,443,000
Fixed (Infrastructure)	$5,501,000
Total Ownership Costs	$13,944,000
PROFIT (LOSS)	$9,358,000

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

Medium Revenue Division
Chester Subdivision at 100%
Impex Traffic at 50%

1987 $

REVENUES	
Carload	$30,700,000
MFRA/ARFAA Payments	$863,000
Subtotal	$31,563,000
Containers	$24,290,000
Total Revenues	$55,853,000
OPERATING COSTS	
Variable	
Crews	$3,182,000
Fuel	$3,681,000
Equipment	$9,573,000
Infrastructure	$8,571,000
Other	$9,629,000
Subtotal	$34,636,000
Fixed	
Infrastructure	$2,560,000
All Other	$1,269,000
Subtotal	$3,829,000
Total Operating Costs	$38,465,000
GROSS MARGIN	$17,388,000
OWNERSHIP COSTS	
Variable	
Equipment	$632,000
Infrastructure	$5,137,000
Subtotal	$5,769,000
Fixed (Infrastructure)	$5,501,000
Total Ownership Costs	$11,270,000
PROFIT (LOSS)	$6,118,000

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

Low Revenue Division
Chester Subdivision at 100%
Impex Traffic at 100%

1987 $

REVENUES	
Carload	$26,842,000
MFRA/ARFAA Payments	$947,000
Subtotal	$27,789,000
Containers	$46,163,000
Total Revenues	$73,952,000
OPERATING COSTS	
Variable	
Crews	$4,752,000
Fuel	$5,638,000
Equipment	$14,184,000
Infrastructure	$12,363,000
Other	$13,658,000
Subtotal	$50,595,000
Fixed	
Infrastructure	$2,560,000
All Other	$1,269,000
Subtotal	$3,829,000
Total Operating Costs	$54,424,000
GROSS MARGIN	$19,528,000
OWNERSHIP COSTS	
Variable	
Equipment	$981,000
Infrastructure	$7,462,000
Subtotal	$8,443,000
Fixed (Infrastructure)	$5,501,000
Total Ownership Costs	$13,944,000
PROFIT (LOSS)	$5,584,000

YEAR 2000 VIABILITY STATEMENT -- HALIFAX - MONCTON LINE

Low Revenue Division
Chester Subdivision at 100%
Impex Traffic at 50%

1987 $

REVENUES	
Carload	$26,842,000
MFRA/ARFAA Payments	$947,000
Subtotal	$27,789,000
Containers	$24,290,000
Total Revenues	$52,079,000
OPERATING COSTS	
Variable	
Crews	$3,182,000
Fuel	$3,681,000
Equipment	$9,573,000
Infrastructure	$8,571,000
Other	$9,629,000
Subtotal	$34,636,000
Fixed	
Infrastructure	$2,560,000
All Other	$1,269,000
Subtotal	$3,829,000
Total Operating Costs	$38,465,000
GROSS MARGIN	$13,614,000
OWNERSHIP COSTS	
Variable	
Equipment	$632,000
Infrastructure	$5,137,000
Subtotal	$5,769,000
Fixed (Infrastructure)	$5,501,000
Total Ownership Costs	$11,270,000
PROFIT (LOSS)	$2,344,000

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

High Revenue Division
Georgia-Pacific at 100%
Stora Forest Products at 100%
Train service of 5/week

1987 $

REVENUES	
Carload	$18,526,000
MFRA/ARFAA Payments	$489,000
Subtotal	$19,015,000
Containers	$1,474,000
Total Revenues	$20,489,000
OPERATING COSTS	
Variable	
Crews	$1,642,000
Fuel	$878,000
Equipment	$3,055,000
Infrastructure	$2,131,000
Other	$1,915,000
Subtotal	$9,621,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$12,309,000
GROSS MARGIN	$8,180,000
OWNERSHIP COSTS	
Variable	
Equipment	$326,000
Infrastructure	$1,303,000
Subtotal	$1,629,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,491,000
PROFIT (LOSS)	$2,689,000

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

High Revenue Division
Georgia-Pacific at 100%
Stora Forest Products at 100%
Train service of 6/week

1987 $

REVENUES	
Carload	$18,526,000
MFRA/ARFAA Payments	$489,000
Subtotal	$19,015,000
Containers	$1,474,000
Total Revenues	$20,489,000
OPERATING COSTS	
Variable	
Crews	$1,950,000
Fuel	$878,000
Equipment	$3,440,000
Infrastructure	$2,203,000
Other	$1,981,000
Subtotal	$10,452,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$13,140,000
GROSS MARGIN	$7,349,000
OWNERSHIP COSTS	
Variable	
Equipment	$386,000
Infrastructure	$1,352,000
Subtotal	$1,738,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,600,000
PROFIT (LOSS)	$1,749,000

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

Medium Revenue Division
Georgia-Pacific at 100%
Stora Forest Products at 100%
Train service of 5/week

1987 $

REVENUES	
Carload	$17,261,000
MFRA/ARFAA Payments	$314,000
Subtotal	$17,575,000
Containers	$1,474,000
Total Revenues	$19,049,000
OPERATING COSTS	
Variable	
Crews	$1,642,000
Fuel	$878,000
Equipment	$3,055,000
Infrastructure	$2,131,000
Other	$1,915,000
Subtotal	$9,621,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$12,309,000
GROSS MARGIN	$6,740,000
OWNERSHIP COSTS	
Variable	
Equipment	$326,000
Infrastructure	$1,303,000
Subtotal	$1,629,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,491,000
PROFIT (LOSS)	$1,249,000

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

Medium Revenue Division
Georgia-Pacific at 100%
Stora Forest Products at 100%
Train service of 6/week

1987 $

REVENUES	
Carload	$17,261,000
MFRA/ARFAA Payments	$314,000
Subtotal	$17,575,000
Containers	$1,474,000
Total Revenues	$19,049,000
OPERATING COSTS	
Variable	
Crews	$1,950,000
Fuel	$878,000
Equipment	$3,440,000
Infrastructure	$2,203,000
Other	$1,981,000
Subtotal	$10,452,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$13,140,000
GROSS MARGIN	$5,909,000
OWNERSHIP COSTS	
Variable	
Equipment	$386,000
Infrastructure	$1,352,000
Subtotal	$1,738,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,600,000
PROFIT (LOSS)	$309,000

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

Medium Revenue Division
Georgia-Pacific at 100%
Stora Forest Products at 100%
Train service of 7/week

1987 $

REVENUES	
Carload	$17,261,000
MFRA/ARFAA Payments	$314,000
Subtotal	$17,575,000
Containers	$1,474,000
Total Revenues	$19,049,000
OPERATING COSTS	
Variable	
Crews	$2,258,000
Fuel	$878,000
Equipment	$3,826,000
Infrastructure	$2,275,000
Other	$2,048,000
Subtotal	$11,285,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$13,973,000
GROSS MARGIN	$5,076,000
OWNERSHIP COSTS	
Variable	
Equipment	$446,000
Infrastructure	$1,401,000
Subtotal	$1,847,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,709,000
PROFIT (LOSS)	($633,000)

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

Low Revenue Division
Georgia-Pacific at 100%
Stora Forest Products at 100%
Train service of 6/week

1987 $

REVENUES	
Carload	$16,236,000
MFRA/ARFAA Payments	$334,000
Subtotal	$16,570,000
Containers	$1,474,000
Total Revenues	$18,044,000
OPERATING COSTS	
Variable	
Crews	$1,950,000
Fuel	$878,000
Equipment	$3,440,000
Infrastructure	$2,203,000
Other	$1,981,000
Subtotal	$10,452,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$13,140,000
GROSS MARGIN	$4,904,000
OWNERSHIP COSTS	
Variable	
Equipment	$386,000
Infrastructure	$1,352,000
Subtotal	$1,738,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,600,000
PROFIT (LOSS)	($696,000)

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

Medium Revenue Division
Georgia-Pacific at 0%
Stora Forest Products at 50%
Train service of 6/week

1987 $

REVENUES	
Carload	$14,108,000
MFRA/ARFAA Payments	$170,000
Subtotal	$14,278,000
Containers	$1,474,000
Total Revenues	$15,752,000
OPERATING COSTS	
Variable	
Crews	$1,896,000
Fuel	$743,000
Equipment	$3,196,000
Infrastructure	$1,700,000
Other	$1,582,000
Subtotal	$9,117,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$11,805,000
GROSS MARGIN	$3,947,000
OWNERSHIP COSTS	
Variable	
Equipment	$374,000
Infrastructure	$1,064,000
Subtotal	$1,438,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,300,000
PROFIT (LOSS)	($1,353,000)

YEAR 2000 VIABILITY STATEMENT -- TRURO - SYDNEY LINE

Low Revenue Division
Georgia-Pacific at 0%
Stora Forest Products at 50%
Train service of 6/week

1987 $

REVENUES	
Carload	$13,200,000
MFRA/ARFAA Payments	$190,000
Subtotal	$13,390,000
Containers	$1,474,000
Total Revenues	$14,864,000
OPERATING COSTS	
Variable	
Crews	$1,896,000
Fuel	$743,000
Equipment	$3,196,000
Infrastructure	$1,700,000
Other	$1,582,000
Subtotal	$9,117,000
Fixed	
Infrastructure	$1,797,000
All Other	$891,000
Subtotal	$2,688,000
Total Operating Costs	$11,805,000
GROSS MARGIN	$3,059,000
OWNERSHIP COSTS	
Variable	
Equipment	$374,000
Infrastructure	$1,064,000
Subtotal	$1,438,000
Fixed (Infrastructure)	$3,862,000
Total Ownership Costs	$5,300,000
PROFIT (LOSS)	($2,241,000)

APPENDIX I

HIGHWAY FINANCE BIBLIOGRAPHY

HIGHWAY FINANCE BIBLIOGRAPHY

- American Association of State Highway and Transportation Officials, Highway Subcommittee on Highway Transport. Task Force on Highway Cost Allocation Studies. **Highway Cost Allocation Study.** Harrisburg, Penn., February 1989.

- Battelle Columbus Laboratories. **The U.S. Experience with Third Structure Highway Taxes: Summary Report.** Columbus: Battelle Columbus Laboratories, 1987.

- Bisson, B.G. **Highway Finance in the Nineties: In Search of Equity, Efficiency and Money.** Paper prepared for presentation at the 1989 RTAC Annual Conference, Calgary, Alberta.

- Bisson, B.G. **Highway Finance: a Literature Review.** Prepared for The Canadian Trucking Association by the University of New Brunswick Transportation Group, Fredericton, N.B. May, 1989.

- Bisson, B.G. and Stevens, A.M. **Collecting and Allocating Road Funds.** In Transportation Forum: Roads to Prosperity, Québec City, April, 1988.

- Bisson, B.G. **Highway Finance - Theories, Principles, Controversies.** Paper presented at the 24th Annual Meeting of the Canadian Transportation Research Forum, Halifax, N.S., May 1989.

- Bunting, M. **The Basis for Highway Cost Allocation.**Transportation Forum, vol. 3-2.19?

- Bunting, P.M. **A Note on Highway Cost Estimation Methodology**: Presentation to RTAC Conference, Edmonton, Alta.Sept.26-9 1983.

- Bunting, P.M. **Highway Cost Recovery and Intercity Trucking.** Paper presented to the 24th Annual Meeting of the Transportation Research Forum, Arlington, Va., November, 1983.

- Bunting, P.M. **Highway Costs and Revenues Attributable to Intercity Trucking.** CIGGT Reports 82-9 and 82-10. Kingston: Canadian Institute of Guided Ground Transport. 1983.

- CP Rail. **Highway Financing Alternatives: Weight-Distance (Third Structure) Taxation.** (Summary of a paper presented November 9, 1988 to the Province of New Brunswick Special Committee on Economic Policy).

- Colquhoun, Robert A. **The Match between Highway Revenues and Costs.** Paper prepared for presentation at the 1989 RTAC Annual Conference, Calgary, Alberta.

- Docwra, George and Chow, Garland. **Road Cost Recovery Issues in Australia.** Paper presented at the 24th Annual Meeting of the Canadian Transportation Research Forum, Halifax, N.S., May 1989.

- Haritos, Z. **Rational Road Pricing Policies in Canada.** Ottawa: Canadian Transport Commission.1973.
- Hutchinson, B.G. **The Impact of Large Trucks in Urban Areas.** Waterloo: University of Waterloo. 1987.
- Kerry, Paul. **Modal Competitive Balance in Canadian Surface Transportation.** Publication not given, 19?
- Lay, M.G. **Costing Truck Infrastructure Effects.** Transportation Journal. Vol. 2-1. 1986
- Martland, C.D. **Improving Railroad Productivity: Implications of U.S. Experience for Canadian Railroads.** Paper presented at the 29th Annual Meeting of the Transportation Research Forum, 1988.
- Nix, F. P. **Study of Vehicle Weight and Dimension Regulations and Canada's Trucking Industry. (3 volumes)**..Final Report (April 1987); Regulations; Case Histories (December 1988). Montreal: Transportation Development Centre, 1987.
- Nix, F. P.**The Impact of RTAC Regulations on Trucking in Canada (TP9570)**, Toronto: University of Toronto, York University Joint Program, 1988.
- Nix, F.P. and Boucher, M. **Long Combination Vehicles in Quebec and Ontario.** Paper presented at the 29th Annual Meeting of the Transportation Research Forum, 1988.
- Nix, F.P. **Road Funding Options in Canada.** RTAC Road to Prosperity Conference Proceedings, 1988.
- Nix, F.P. **Road-User Costs: Report on Exploratory Research (1).** Paper presented at the 24th Annual Meeting of the Canadian Transportation Research Forum, Halifax, N.S., May 1989.
- Nix, F.P. **Structure of Road-User Taxes for Large Commercial Trucks in Canada.** Paper presented at the 21st Annual Meeting of the Canadian Transportation Research Forum, Vancouver, B.C., May 1986.
- Oregon Department of Transportation. **Motor Vehicle Cost Responsibility Study 1980, Final Report,** Oregon Department of Transportation, 1981.
- Oregon Department of Transportation. **Motor Vehicle Cost Responsibility Study 1980, Technical Addendum.** Oregon Department of Transportation, 1981.
- Oregon Department of Transportation. **Motor Vehicle Cost Responsibility Study 1986, Final Report.** Oregon Department of Transportation, 1988.
- Transmode Consultants. **Motor Carrier Costs: An Assessment of Technological and Regulatory Factors.** Final Report to the Railway Association of Canada. Transmode Consultants, 1988.
- Transport Canada. **Research and Development Opportunities for advancing Highway Freight Transport Technologies. (TP 9473)**, Part II. Highway

Freight Transport in Canada: an Overview; Part III. R & D Objectives and Priorities in the Federal Government. Ottawa: March, 1989.

- Transport Canada. Strategic Policy Directorate. **Transport Costs and Revenues in Canada 1969-1979. (TP 3737).** Ottawa: Queen's Printer, 1982.

- U.S. Department of Transportation. Federal Highway Administration. **America's Challenge for Highway Transportation in the 21st Century**, VII: Federal Highway Options. Washington: Federal Highway Administration. 1988.

- U.S. Department of Transportation. Federal Highway Administration. **Heavy Vehicle Cost Responsibility Study.** Report of the Secretary of Transportation to the United States Congress pursuant to Section 931 of the Deficit Reduction Act of 1984. Washington: Federal Highway Administration, 1988.

- U.S. Department of Transportation. **Final Report on the Federal Highway Cost Allocation Study.** Washington: U.S. Department of Transportation, 1982.

- U.S. Department of Transportation. **The Feasibility of a National Weight-Distance Tax.** Report of the Secretary of Transportation to the United States Congress pursuant to Section 933 of the Deficit Reduction Act of 1984. Washington: U.S. Department of Transportation, 1988.

- U.S. General Accounting Office. **Excessive Truck Weight: An Expensive Burden we can no longer support.** Report by the Comptroller General of the United States. Washington: U.S. General Accounting Office, July 16, 1979.

- Wight, A. S. **Highway Cost Allocation in Canada: Towards a More Equitable Cost Structure.** Unpublished M.B.A. Thesis. Montreal: Concordia University, 1985.

- Wilson, F. R. **Road User Charges: A Proposal for Change.** Fredericton. University of New Brunswick, 1987.